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ABSTRACT

"Action Research" and the "Encyclopedia of Distance Education Research" (1994) are designed as resources for distance education research in Iowa, including information on developing, implementing, and administering distance education systems. This addendum containing an additional seven research studies includes the following papers: "Innovations in Volunteers for a Telecommunications Project," by Omalley Ehren Abel; "Distance Education Policy and Iowa Schools: A Survey of Administers," by Tom Clark and David Else; "An Investigation of Potential Access to Role Models for At-Risk Females Using the Iowa Communications Network," by Teresa J.K. Hall and Margaret Torrie; "A GED Math and Science Test Preparation Option: The Iowa Communications Network," by Lynn Reese; "A Study of the Motives and Factors Affecting Participation in Adult Distance Education Classes in an Iowa Community College: A Preliminary Report," by Roger J. Rezabek; "The Utility of Interactive Study Guides as a Means To Enhance Content Interaction and Student Satisfaction in Interactive Television Course Utilizing the Iowa Communications Network," by Thomas S. Westbrook; and "Studio Ceramics over the Iowa Communications Network," by Kristen Egeland Wright. (AEF)

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DISTANCE EDUCATION IN IOWA

INNOVATION
COMMUNICATION
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EDUCATION
TELECOMMUNICATION
POLICIES
TEACHER
TRAINING
TECHNOLOGY
STUDENT
OPPORTUNITIES
RESOURCES
EDUCATION
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FACTORS
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AVAILABILITY
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CONVENIENCE
INTERACTIVITY
EVALUATION
FEASIBILITY
COMMUNICATION
RESULTS
IMPLEMENTATION
DESIGNS
INVESTIGATION
APPLICATION
APPROACHES
FEEDBACK

ACTION RESEARCH

Addendum to the Encyclopedia of Distance Education Research in Iowa Revised 2nd Edition

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Preface

The first edition of the Encyclopedia of Distance Education Research in Iowa was published in 1994. A revised edition was completed in 1995, and a significantly larger 2nd edition became available in the summer of 1996. Since then, over 1500 copies of the Encyclopedia have been distributed to educators, administrators, and policy-makers in the United States and a number of other countries.

Because of the success of the Encyclopedia, Action Research, an addendum to the 2nd edition, was begun during the fall of 1997. Action Research contains an additional seven research studies that were recently completed.

This Encyclopedia and Action Research are designed for use by those responsible for developing, implementing, and administering distance education systems. Also, it is a tool for researchers who are investigating issues related to distance education. It is hoped that the studies and reviews contained in the Encyclopedia and Action Research will serve as a foundation for additional research in this important area.

Many individuals and organizations contributed to this publication. Fundamental to the development and publication of Action Research were the efforts of the Technology Research and Evaluation Group of the Department of Curriculum and Instruction at Iowa State University. This group coordinated the process of writing, editing, formatting, and publishing Action Research. Certainly the individual researchers who contributed the articles contained within this document are to be commended, also.

Finally, it is important to acknowledge the U.S. Department of Education's Star Schools Program which provided funding for Action Research's publication and distribution. It is anticipated that a third edition of the Encyclopedia will be published in 1998.

Innovativeness in Volunteers for a Telecommunications Project

Omalley Ehren Abel
Iowa State University

Introduction

A project was funded, in 1996, by the US West Foundation to create a statewide collaborative support system to help K-12 teachers integrate computer-based telecommunications technology as a tool for improving teaching skills and student learning." Laptop computers were given to 400 Iowa teachers identified as novice computer users. These teachers were then be trained to use telecommunications technologies. Afterwards, each teacher was expected to educate ten other teachers in their local area.

This study looked at the baseline innovativeness of teachers selected for a telecommunications project, the perceived organizational innovativeness of the teacher's school and the computer anxiety level of the teachers. Additionally, demographic data were collected. These data were compared with data from identical surveys collected from 277 randomly selected teachers in the state of Iowa.

Rogers' Diffusion of Innovations Theory (1995) was the foundation of this study and served as a tool for evaluating the first stages of this two-year-long project. The information gathered from this preliminary study was the first step in assembling generalizable information about volunteers for a telecommunications project and the use of computers and telecommunications technologies, by trained teachers, for improving teaching and learning.

Significance and Need

One of the strengths of any project is its evaluation; this study forms a picture of the teacher participants before they begin the project and contrasts it with a picture of Iowa teachers in general. This will give a look at those who volunteer for a project of this nature and how they compare to the general population. This preliminary evaluation will aid in the future application of telecommunications technology. In addition, this preliminary look at the teacher participants will serve as a guide for future evaluation of the project.

According to Clark (1989), an early commitment to evaluation, beginning at the start of a distance learning program, will provide useful infomation as well as allow for changes as the program continues. Iowa is just embarking on its distance education program; the US West Foundation is also at the beginning of its project on telecommunications and distance learning. It is hoped that this study would: provide useful and timely information that will assist others in their implementation efforts; expand the knowledge base about distance education and telecommunications programs, and; serve as a catalyst for future studies in distance education and telecommunications.

Study Description

The purpose of this study was to identify generalizable information about the use of computers and telecommunications technologies by volunteers for a telecommunications project. The following research questions were addressed:

Are teachers who volunteer for a telecommunications project more or less innovative than Iowa teachers in general?

Do teachers who volunteer for a telecommunications project perceive their schools to be more or less innovative than Iowa teachers in general?

Do teachers who volunteer for a telecommunications project have more or less computer anxiety than Iowa teachers in general?

How do demographic data compare between teachers who volunteer for a telecommunications project and Iowa teachers in general?

The Instrument

Data for this study were collected using a survey developed locally. Questions were asked regarding demographics, and experience with computers and computer applications. In addition, this survey makes use of the Innovativeness Scale (IS), the Perceived Organizational Innovativeness Scale (PORGI), and the Computer Anxiety Index (CAIN). For each of these scales, validity and reliability have already been tested and the tests are standardized.

The Innovativeness Scale was developed by Hurt, Joseph, and & Cook in 1977 as a self-report measure of innovativeness and is not innovation specific. The scale was based upon the premise that innovativeness is a personality trait defined as a willingness to change. Rogers defines innovativeness as "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than the other members of a system (p. 22). Hurt, Joseph, and Cook's scale consists of 20 items based on Rogers and Shoemaker's five innovativeness categories: innovators, early adopters, early majority, late majority, and laggards. These categories allow for assumptions to be made about where on the willingness-to-change continuum a respondent lies. Respondents were asked to indicate their degree of agreement or disagreement to each item (Hurt, Joseph, & Cook, 1977).

The Perceived Organizational Innovativeness (PORGI) scale was developed by Hurt & Teigen (1977) as a self-report measure of organizational innovativeness as seen through the eyes of the employee. The scale is a 25 item survey using the same agree to disagree responses as the Innovativeness Scale. PORGI gives researchers the opportunity to administer easy and inexpensive surveys, to "correctly predict satisfaction with certain aspects of employment and the degree of employee participation in the organizational-decision process," and to explore "the impact of perceptual discrepancies of organizational innovativeness between employees and management personnel on the acceptance and continued use of an innovation" (Hurt & Teigen, 1977, p. 383).

The Computer Anxiety Index is a questionnaire consisting of items designed to identify respondents who have computer related anxieties. "Computer anxiety is defined as the fear or apprehension felt by individuals when they use computers or when they consider the possibility of computer utilization" (Simonson, 1992, p. 12). The Computer Anxiety Index was developed on the basis of this definition. The survey consists of 26 items to which respondents are asked to identify their level of agreement or disagreement (Simonson, Montag, Maurer, Oviatt, & Whitaker, 1992).

Sample Population

The subjects for this study were the 400 teachers selected to participate in the US West Teacher Technology Project and 277 randomly selected Iowa teachers. The selection process for project participants was coordinated by ISEA (Iowa State Education Association) and began with the distribution of applications in their newsletter. From the 1521 applications received, 262 were pulled as they were judged to be over qualified and were notified of this decision. From the remaining applications, 395 were randomly chosen to participate in the project. As of June 1997, only 379 teachers remained as participants in the project and became the sample for this study. Of this number, 377 returned surveys.

The group of Iowa teachers to be used as the control group was selected randomly by the researcher with the help of the Iowa Department of Education. Of the original 400 teachers randomly sampled, 105 returned surveys. An additional 400 teachers were selected and surveys were mailed. In this second round, an additional 172 surveys were returned for a total of 277 surveys.

Findings

Demographics

There were very few differences, demographically, between the two groups. The percentages of male and female were approximately 30%/70% for both groups and the average age was 43 years. Most participants (those selected to participate in the project) as well as non-participants (the randomly selected group of Iowa teachers) had at least a bachelor's degree plus 15 credits with 52% of participants and 42% of non-participants having at least

a master's degree. Both participants and non-participants had on average 17 years of teaching experience. The largest group of participants taught at the elementary level (41.8%), followed by high school (25.0%) and middle school (21.8%). Non-participants had similar results with 38.9%, 27.3%, and 17.1% respectively. Both groups reported, on average, belonging to more than two professional organizations. A summary of the results is presented in Table 1.

Table 1. Demographic Data

	Participants	Non-Participants
Gender:		
male	26.9%	30.0%
female	73.1%	70.0%
Average age:	43.5 years	43.2 years
Race or national origin:		
African-American/Black	0.3%	0.4%
American Indian or Alaskan Native	0.3%	0.0%
Asian-American or Pacific Islander	0.3%	0.4%
Arab or Middle Eastern Origin	0.0%	0.0%
Caucasian/White	96.0%	97.5%
Mexican-American or Hispanic Origin	0.5%	0.0%
Other	0.8%	0.0%
Do not wish to share this information	1.9%	1.8%
Level of education:		
BS/BA	9.8%	16.2%
BS/BA + 15 sem. cr.	38.3%	41.9%
MS/MA	18.9%	16.6%
MS/MA + 15 sem. cr.	31.4%	23.8%
Ph.D/Ed.D	1.6%	1.4%
Average years of teaching experience:	17.7 years	17.5 years
Level taught:		
Elementary School	41.8%	38.9%
Middle School	21.8%	17.1%
High School	25.0%	27.3%
K-12	4.0%	4.0%
Elementary/Middle School	2.1%	4.0%
Middle/High School	5.1%	8.4%
Elementary/High School	0.3%	0.4%
Own a personal computer:		
yes	73.5%	68.6%
no	26.5%	31.4%
Avg. number of professional organizations:	2.7	2.4

Experience with Computers and Computer Applications

Most participants (73.5%) and non-participants (68.6%) already owned a personal computer. In both groups, over 40% reported having some experience with computers and over 45% reported quite a bit or extensive experience. Most respondents in both groups had at least some experience with word processing programs and over 60% reported having quite a bit or extensive experience. Not as many participants or non-participants were experienced with spreadsheets or databases. Over 50% of both groups reported having very little or no experience with spreadsheets and over 58% reported very little or no experience with databases. A visible difference appeared between participants and non-participants when looking at experience with E-mail and the World Wide Web. Fewer participants (33.7%) than non-participants (42.4%) reported very little or no experience with E-mail and 33.7% of participants and 26.4% of non-participants reported some experience. Even greater is the difference when looking at the World Wide Web. While 34% of participants reported very little or no experience with the World Wide Web, 51.3% of non-participants reported the

same. 41.7% of participants and 26.4% of non-participants reported some experience with the World Wide Web. A summary of participant and non-participant responses to questions of experience with computers and computer applications is presented in Table 2.

Table 2. Level of Experience with Computers and Computer Applications

	Participants	Non- participants
Computers		
none or very little	6.4%	8.4%
some	47.2%	42.3%
quite a bit or extensive	46.4%	49.3%
Word processing programs		
none or very little	7.0%	11.6%
some	30.9%	25.0%
quite a bit or extensive	62.1%	63.4%
Spreadsheets		
none or very little	56.5%	50.2%
some	28.9%	28.0%
quite a bit or extensive	14.6%	21.9%
Databases		
none or very little	60.9%	58.5%
some	29.0%	26.0%
quite a bit or extensive	10.1%	15.5%
E-mail		
none or very little	33.7%	42.4%
some	33.7%	26.4%
quite a bit or extensive	32.6%	31.2%
World Wide Web		
none or very little	34.0%	51.3%
some	41.7%	26.4%
quite a bit or extensive	24.3%	22.4%

Innovativeness

The average innovativeness scores were computed for both participants and non-participants. The possible range of scores on the innovativeness scale is 20-140 with higher scores indicating higher innovativeness. Participants had an average innovativeness score of 111.47 while non-participants had an average of 106.71. Results from a t-test indicated that the participant volunteers were more innovative than the population of Iowa teachers in general (non-participants).

Perceived Organizational Innovativeness

On the perceived organizational innovativeness scale, the possible range of scores is 25-175 with higher scores indicating a higher perception of organizational innovativeness. Participants gave their organizations an average score of 114.65 while non-participants gave their organizations an average score of 115.37. Results from a t-test indicated that this difference in scores was not significant and shows that the participants and non-participants perceived their organizations to be equally innovative.

Computer Anxiety Index

The possible range of scores for the Computer Anxiety Index is 26-156, with lower numbers indicating less computer anxiety. The average score for the norm group was 60.23. The participants in this project had an average of 45.83, denoting less computer anxiety than the norm group. Responses from non-participants had an average of 49.38 which was also lower than the norm group but significantly higher than the participants (as indicated by a t-test).

Overall, most participants as well as non-participants had relatively low computer anxiety. The distribution of the anxiety scores did not fall into a normal distribution and 85% of

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participants as well as 65% of non-participants fell below the mean of the norm group. 2.4% of participants and 2.9% of non-participants indicated high levels of computer anxiety, defined as 2 standard deviations or greater above the mean.

Table 3. IS, PORGI, and CAIN

	Participants	Non- participants
IS*		
mean	111.47	106.71
standard deviation	12.48	13.44
PORGI**		
mean	114.65	115.37
standard deviation	26.67	24.11
CAIN***		
mean	45.83	49.38
standard deviation	16.43	18.59

*The possible range was 20-140 with higher scores indicating higher innovativeness.
**The possible range was 25-175 with higher scores indicating higher perceptions of organizational innovativeness.
***The possible range was 26-256 with higher scores indicating higher level computer anxiety.

Correlations

When looking at participants' level of innovativeness, a number of statistically significant relationships were apparent. As the participants' innovativeness increased, so did their level of experience with computers, word processing, databases, spreadsheets, E-mail and the World Wide Web. Similar significant relationships were found in the non-participant responses. Innovativeness was also found to have a positive relationship, for both participants and non-participants, with level of education (.11 for participants and .13 for non-participants) and the number of professional organizations to which they belong (.17 and .10 respectively). A positive relationship was found between innovativeness and perceived organizational innovativeness among participants (.21) but not among non-participants. A negative relationship was found, in both participants and non-participants, between innovativeness and computer anxiety (-.22 and -.39 respectively), meaning the higher the innovativeness score, the lower the computer anxiety. With participants, no statistically significant relationship was found to exist between innovativeness and years of teaching experience, however, a negative relationship was found between the two with non-participants (-.06).

When looking at the perceived organizational innovativeness score (PORGI), among participants there was a positive relationship between PORGI and years of teaching experience (.11). Non-participants did not show this relationship but did show a positive relationship between PORGI and level of experience with E-mail (.19). As mentioned previously, participants were found to have a positive relationship between PORGI and innovativeness (.21) but non-participants did not report this relationship as significant.

For both participants and non-participants, the computer anxiety score showed a negative relationship with the level of experience with computers (-.20 and -.45), word processing (-.25 and -.51), spreadsheets (-.15 and -.38), and the World Wide Web (-.17 and -.29). This indicated that as the respondents' level of experience went up they had a lower level of computer anxiety. In addition, non-participants showed a similar relationship with level of experience with databases (-.31) and E-mail (-.27). Differing statistically significant relationships were found with level of education where participants had a positive relationship with computer anxiety (.12); innovativeness, where participants had a negative relationship with computer anxiety (-.22); and years of teaching experience, where non-participants had a positive relationship with computer anxiety (.15). A summary is presented in Table 4.

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Table 4. Correlations

	Part.			Non-part.		
	IS	PORGI	CAIN	IS	PORGI	CAIN
Age	.07	.10*	.07	-.04	.02	.11
Computer experience	.17*	-.08	-.20*	.29*	-.03	-.45*
CAIN[a]	-.22*	-.08		-.39*	-.01	
Database experience	.18*	-.05	-.10*	.27*	-.03	-.31*
Level of education	.11*	.03	.12*	.13*	-.04	-.03
E-mail experience	.18*	-.10	-.08	.25*	.19*	-.27*
IS[b]		.21*	-.22*		.10	-.39*
Number of professional orgs.	.17*	.05	-.01	.10	-.09	-.01
PORGI[c]	.21*		-.08	.18*		-.01
Spreadsheet experience	.12*	-.06	-.15*	.27*	-.05	-.38*
Teaching experience	.03	.11*	.08	-.06	.02	.15*
Word processing experience	.20*	-.05	-.25*	.30*	-.06	-.51*
WWW experience	.19*	-.05	-.17*	.27*	.05	-.29*

*$p<.05$

[a]CAIN is a measure of computer anxiety.

[b]IS is a measure of innovativeness.

[c]PORGI is a measure of perceived organizational innovativeness.

Comparisons

Independent t-tests were conducted to determine if there were differences in the variable scores on the basis of participant/non-participant. A significance level of .05 was set. A summary of the findings in which significant differences appeared is presented in Table 5.

Seven variables, CAIN, IS, level of education, experience with E-mail, experience with spreadsheets, experience with the World Wide Web, and the number of professional organizations to which the teachers belonged, were found to be significantly different. For all variables, participants were found to have higher ratings with the exception of experience with spreadsheets where non-participants rated higher.

Table 5. Comparison of Significant Variables (Significance level <.05)

Variable	N	Mean	SD	t-value	Probability*
CAIN(measure of computer anxiety)				-2.37	.02
participants	376	45.83	16.43		
non-participants	277	49.09	18.59		
IS(measure of innovativeness)				4.61	<.01
participants	376	111.47	12.48		
non-participants	277	106.71	12.44		
Level of Education				2.89	<.01
participants	376	2.77	1.05		
non-participants	277	2.52	1.07		
Experience with E-mail				2.27	.02
participants	377	2.91	1.11		
non-participants	276	2.70	1.28		
Experience with Spreadsheets				-2.03	.04
participants	377	2.44	1.00		
non-participants	275	2.60	1.11		
Experience with the World Wide Web				3.54	<.01
participants	374	2.82	1.01		
non-participants	277	2.52	1.20		
Number of Professional Organizations				2.23	.03
participants	374	2.69	1.64		
non-participants	273	2.40	1.64		

Discussion

Demographic data showed that most participants in this project already owned personal computers as did non-participants and more than 40% of each group had some to extensive experience using computers. Participants and non-participants had varying levels of experience using different software programs and the Internet. The greatest differences were found in E-mail and the World Wide Web. Most participants, as did non-participants, had relatively low computer anxiety although, as noted above, differences do exist.

Overall, the participants in the US West project were more innovative than non-participants. In addition, participants had less computer anxiety than non-participants. When looking at participants' and non-participants' perceptions of organizational innovativeness, no differences were found.

Based on correlations, positive relationships were found, in both participants and non-participants, between innovativness and level of experience with computers and computer applications. Positive relationships in both groups were found between innovativeness and level of education and number of professional organizations. Both groups showed a negative relationship between innovativeness and computer anxiety, indicating that the more innovative an individual, the lower the computer anxiety. Computer anxiety was shown to correlate positively in both groups with level of experience with computers and some computer applications.

In summary, significant differences were found to exist between participants and non-participants. Participants were found to have less computer anxiety, be more innovative, have a higher level of education, have more experience with E-mail and the World Wide Web, and belong to more professional organizations. Non-participants, on the other hand, were found to have more experience using spreadsheets.

Overall, the data indicate that volunteers for a telecommunications project tend to be more innovative and have more computer-related experience. This was especially evident in the levels of experience using the telecommunications technologies themselves.

Limitations

One of the greatest limitations of this study was that the sample of Iowa teachers in general (non-participants) could have been selected in such a way as to more closely match the sample of participants in the project. In any study, researchers tend to have a difficult time finding people who will participate. In this case, we might be able to make the assumption that those who fill out surveys or volunteer for participation may be more innovative than the sample as a whole. A valuable future study might look at the responses and innovativeness levels of those volunteers compared with an equivalent sample of those reluctant to participate. The control group (non-participants) for this study self-selected themselves and resulted in the need to sample a larger number to get enough subjects.

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Distance Education Policy and Iowa Schools: A Survey of Administrators

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Introduction

Educational policy decisions must be made at every level in order for a complex statewide distance education system such as the Iowa Communications Network (ICN) to function effectively. As Sorensen and Sweeney concluded in the internal evaluation of the Iowa Star Schools project in December 1994 by the Iowa Distance Education Alliance (IDEA), "District and/or regional and/or state policies need to be determined for teaching over the ICN" (p. iii). In their summary remarks, they noted that as the ICN grows, its successful use may hinge on key educational policy issues such as additional planning, released time and compensation for teachers, the coordination of common calendars and class schedules, the role of the non-origination site facilitator, and local costs of maintaining ICN facilities.

It is important for regional and state-level educational policy makers to take the viewpoints of school administrators into account in reaching distance education policy determinations that will impact the effective use of the ICN by schools. As Starratt (1988) noted, "... administrators at the state, district, or building level can exercise leadership, not only in implementing policy, but also in reviewing and evaluating policy" (p. 142). Goal 6.2 of the current (1996-1998) funded Iowa Star Schools project, states that "The evaluation team will work with key stakeholder groups in determining future policy development issues and implications" (Iowa Distance Education Alliance, 1997). It is our belief that school administrators are such a key stakeholder group.

Role of building principals

Of all school administrators, high school principals with ICN video classrooms in their buildings are perhaps most directly involved in policy issues related to effective ICN use. The legislatively mandated plan for completing the ICN specifies that an ICN "point of presence" and video classroom site will be established in at least one high school in each of Iowa's public school districts by June 2000, when over 600 ICN sites are scheduled to be operational, if implementation plans are completed. Internet connectivity is also available to all institutions obtaining an ICN "point of presence".

At most of these sites, the building principal will have primary responsibility for most decisions related to use of the school's ICN video classroom and Internet connections by the school community. Many of these principals will have played active leadership roles from the beginning in the local process of obtaining an ICN video classroom, preparing for use of the ICN video system, and day-to-day management of its use and surrounding issues. Many will also have developed Internet capabilities at their schools through the ICN.

Distance education has significant impact on K-12 policy at every level

School administrators nationwide are increasingly called upon to make policy in relation to distance education (Clark & Else, 1998). Administrators at all educational levels must work together to make successful use of an educational network such as the ICN. Most distance education policy issues in K-12 go beyond the school and building level to at least the district level.

K-12 administrators need to deal with these issues now.

In order to effectively participate in shared use of the ICN with external parties and administer effective use of the ICN within their institutions, school administrators need to know what kinds of policy issues they are likely to face and their relative importance for effective distance learning and administration at the school level. They also need to know what approaches to policy issues have worked for others. As Iowa K-12 schools are added

over time to the network, their administrators will deal with a progression of issues related to distance education and network use. Many of these administrators will have substantial prior exposure to related issues, but not at the same magnitude.

Related Research

Few previous distance education policy studies have had a primary focus on school administrator perceptions of distance education policy. Most distance education policy studies have concerned higher education policy and/or state-level educational telecommunications policy (such as Epper, 1996). School administrators have been surveyed in a few recent related studies of distance education policies and practices. Stammen (1994) reports a 1993 survey in North Dakota of 124 principals and superintendents on their interest and concerns with regard to potential interconnection of K-12 schools with the statewide university system's compressed video network. Barker and Hall (1993) reported a national survey of a random sample of building principals in 130 small rural school districts, on distance education usage in their schools. Barker and his colleagues have researched and written extensively in the area of distance education in rural schools from the viewpoint of the school administrator (Barker, 1991, 1992; Barker & Dickson, 1996; Beckner & Barker, 1994).

Barker and his coauthors identify many operational issues for school administrators related to distance education, such as costs, materials transfer, classroom management, remote site visits by teachers, qualifications and evaluation of teleteachers, qualifications and duties of classroom facilitators, technical breakdowns, teacher training, scheduling, class size, and local control. Schlosser and Anderson (1994) also provided a thorough review of many of the operational issues related to the administration of distance education in terms of management, personnel, programming and facilities in a review of the literature developed as part of the early research effort for the Iowa Distance Education Alliance.

School and school district enrollment

In an ERIC Digest review on the academic effectiveness of small-scale schooling, Howley (1994) notes that: "The charge is made that small high schools cannot provide a curriculum with adequate breadth and depth to meet students' diverse needs. Yet evidence suggests that a total enrollment of 400 students is actually sufficient to allow a high school to provide an adequate curriculum" (p. 1). Monk (1986) found that secondary schools with enrollments under 400 had difficulty offering a comprehensive curriculum.

Abel and Hays (1997) surveyed the principals of the 73 high schools connected to the ICN in April 1996, in order to examine the relationship between the innovativeness of principals and the use made by their schools of the ICN. Their response rate was high (88%), indicating substantial interest on the part of principals in survey participation. No significant differences in principal's perceptions of their own innovativeness or their school's innovativeness, as measured through a brief instrument, were found based on the degree to which the schools had acted as originating sites or participating sites in ICN video classroom courses. Most principals participating in the survey saw themselves and their schools as innovative.

Significance of the Study

The present study is intended to help inform educational policy decision-makers of the range of perceptions of local school administrators on important distance education policy issues. A study of policy issues at the local and district level related to distance learning and the ICN could inform policy work at the regional and state level, help principals of new ICN sites set priorities, and might also have utility for educators in other states developing similar distance learning systems. Although the present study was conducted in Iowa, the researchers were interested in obtaining findings that can also inform the practice of school administrators in other states.

Purpose and Objectives

The purpose of this study is to identify and prioritize distance-education-related policy issues seen as important by school administrators, and identify differences in administrator

perceptions of these issues. The results of this study may aid local administrators in policy prioritization, and inform regional and state-level policymakers of the perceptions of local administrators at ICN school sites.

The main objectives of this study are:

1. To identify and prioritize distance-education-related policy issues seen as important by school administrators, based on their ICN experience, and explore why they see these issues as important.

2. To identify differences between school administrators in their perceptions of distance-education-related policy issues, in terms of their years of administrative experience, high school enrollment and community population, the length of time since their video and Internet connections became operational, and related variables.

Procedures

Population and Sample

The universe for the study was all principals at high schools with ICN classrooms in April 1996. Because some of the questions dealt with principal experience with the ICN, it was felt that only principals at schools that had been network sites for a year or more should be included in the study. In April 1996 there were 73 high schools connected to the ICN. The list of ICN sites is the same as that obtained by Abel and Hays from Iowa Public Television for their study published in the second edition of the Encyclopedia of distance education research in Iowa in February 1997. The researchers recognized the limitations on generalizability arising from use of such a nonrandom sample. However, given the qualifications and experience needed to fully answer the kinds of questions posed in this exploratory study, they believed the use of this small nonrandom sample was justified.

Instrumentation

The questionnaire used in the survey was developed by the researchers after reviews of the related research literature and the findings of previous (December 1994 and June 1996) IDEA Star Schools project evaluations. The instrument was reviewed and pre-tested in March 1997 by a current high school principal who had experience working with the ICN, but who had not been a respondent in the Abel and Hays study published in February 1997. Basic reliability and suitability of this exploratory instrument were then established through administration of the instrument to fourteen individuals who were either working principals or studying for principal or superintendent certification, and currently enrolled in certification or degree program courses at the University of Northern Iowa.

The first section of the questionnaire consisted of 15 Likert-type items about policy issues impacting schools. For each item, respondents were first asked to indicate their attitude toward the statement, "This issue is important for my school's effective use of the ICN," and then their attitude toward the statement, "This issue is currently being adequately addressed." Nine additional Likert-type items on support for use of technology and access to technology followed. The six response categories for the Likert-type items ranged from (1) "Strongly Disagree" through (6) "Strongly Agree".

In the second section of the survey, principals were asked to rate the extent of their personal knowledge of distance education and their school's involvement in distance education. They also were asked for school information such as length of time on the ICN and the Internet, calendar and scheduling systems used, and high school enrollment. The third section of the questionnaire consisted of two open-ended response items. Respondents were asked to list as many issues as they felt were appropriate for each of the following two questions:

(a) Based on your own experience, what are the key related issues you have faced as a principal, since your school completed its ICN connection/ICN video classroom?

(b) Based on your own experience, what are the key related issues facing a principal whose school is acquiring an ICN connection/ICN video classroom, during the construction phase and the first year of operation?

The survey concluded with four closed-response items requesting personal demographic information, including gender and length of experience as a building principal and teacher. Further demographic information was not requested to limit non-response in this exploratory study.

Data Collection

Questionnaires were mailed to the survey population in late July 1997, along with a cover letter and a pre-stamped return envelope. Five weeks later, a second mailing was made to non-respondents. Most of the principals surveyed were heavily involved in beginning the academic year at their schools throughout the month of August. This led the researchers to somewhat delay the second mailing. Fifty-three of 73 principals surveyed returned a usable questionnaire, for a total response rate of 72.6%.

For the present study, it was decided that comparing perceptions of principals in the survey population whose high schools had smaller (< 400) and larger (≥ 400) enrollments might yield some interesting differences of opinion. Respondents self-reported current enrollment, which was used to code smaller and larger schools. City/town population data was obtained from the 1990 U.S. Census for use with urbanity/rurality criteria cited in the U.S. Department of Education's 1996 Schools and Staffing Survey. The survey population was coded based upon whether the high school was classified as rural (city/town population < 2500), or as small and large town ($2500 \leq$ city/town population $\leq 50{,}000$). The survey population split into roughly even groups by school enrollment and city/town population, facilitating statistical comparisons.

Results

Respondent Characteristics and Representativeness

Clearly, in comparison with all high schools statewide, the characteristics of schools whose principals served as the study's survey population differed in some ways. About 71% of high schools with direct ICN connections in April 1996 were in medium-sized districts (600 to 2499 students), while only about half of all high schools statewide were located in these medium-sized districts. Smaller high schools were not as well represented at this early stage of ICN network connection growth. The state's regions were also not evenly represented in terms of high schools on the ICN. Some large high schools in urban areas had operational video classrooms on metropolitan educational telecommunications networks, with secondary connections to the ICN, and therefore their principals were not in the sample population.

Over half of respondents had ten or more years of experience as a building principal, although about 21% had less than five years experience. Only about 8% had been teachers for less than five years. Six of 47 (13%) reported their gender as female, higher than expected in light of the reported 3% percentage of Iowa public secondary school female principals in 1993-94 (NCES, 1996). However, the small number of women in the sample still limited the utility of statistical comparisons of attitudes by gender.

Ranking Policy Issue Perceptions

A central focus of the current study is analysis of respondent perceptions on (1) which policy issues are most important, and (2) how adequately they are currently being addressed. While ranking perceptions on (1) and (2) separately is useful, ranking the significance of differences between perceptions on (1) and (2) is probably even more useful in terms of generating priorities for action.

Importance of named policy issues

Table 1, Perceived Importance of Named School Policy Issues for Effective ICN Use, shows that a majority of responding principals considered almost all of the named issues at least somewhat important. However, levels of perceived importance varied considerably across the named issues.

Table 1
Perceived Importance of Named School Policy Issues for Effective ICN Use, Ranked By Mean Score (1)

Rank	Variable	Mean	SD	N	% Agree (2)
1	Teach/Administrator Video Classroom Training	5.06	1.22	53	92.5
2	Common Semesters	5.06	1.29	53	88.7
3	Teacher/Administrator Internet Training	5.02	1.10	51	90.2
4	Matching ICN courses with Best Available Sites	4.96	.94	52	90.2
5	Common Bell Schedules	4.87	1.39	53	84.9
6	Supervision, Proctoring, After-Hours Staffing	4.84	1.10	51	88.2
7	Internet Acceptable Use Policy	4.81	1.12	52	88.5
8	Technical Support for Hardware, Software, ICN Network Usage	4.71	1.22	51	86.3
9	Student Internet Training	4.60	1.30	52	86.5
10	School/ICN Video Classroom Closings, Session Cancellations	4.41	1.30	51	80.4
11	ICN Classroom Site Cost Determination/ Billing	4.25	1.53	53	75.5
12	Teacher Rewards	4.18	1.42	51	74.5
13	Copyright Use Guides	4.15	1.23	52	78.8
14	Student Video Classroom Training	4.02	1.49	52	65.4
15	Teacher Job Security Concerns	3.33	1.68	52	48.1

(1) Attitudes toward items on a scale ranging from "1" = "Strongly Disagree" to "6" = "Strongly Agree"
(2) Cumulative percentage, respondents replying "4" = "Moderately Agree," "5" = "Agree," or "6" = "Strongly Agree"

Training Issues. Ranked by mean scores on a six-point Likert scale, two of the top three named issues in terms of perceived importance for effective ICN use were training-related. Teacher and administrator video classroom training was ranked 1st (Mn = 5.06, 92.5% agreed it was important), while teacher and administrator Internet training (Mn = 5.02, 90.2%) was ranked 3rd. Another training issue, student Internet training, was ranked 9th (Mn = 4.60, 86.5%). While not as strongly supported as teacher and administrator training, student Internet training but was nevertheless widely agreed upon as important. The same cannot be said of student video classroom training, which was significantly less likely to be agreed important (Mn = 4.02, 65.4%) than the same kind of training for teachers. It ranked 14th out of 15 issues.

Coordination Issues. Joining teacher and administrator training issues at the top of the list were three coordination issues. Common semesters were ranked 2nd in importance for effective ICN use (Mn = 5.06, 88.7% agreed it was important). Matching ICN courses with sites was ranked 4th (Mn = 4.89, 88.5%) and common bell schedules 5th (Mn = 4.87, 84.9%). Agreement on importance was significantly lower for session cancellations and closings, ranked 10th (Mn = 4.41, 80.4%) and ICN cost/billing, ranked 11th (Mn = 4.25, 75.5%).

Support issues. Support issues followed coordination issues in terms of level of agreed importance. These two named issues were staffing, ranked 6th (Mn = 4.84, 88.2% agreed) and technical support, ranked 8th (Mn = 4.71, 86.3%).

Teaching issues. A written policy issue related to teaching, the Internet acceptable use policy, was ranked 7th in terms of mean score (Mn = 4.81), but 4th in terms of cumulative percentage of respondents agreeing it was an important issue (88.5%),. This item did not receive as many "strongly agree" scores as more "hot-button" issues such as common semesters. A second teaching-related written policy issue, copyright use guides, was ranked 13th in importance (Mn = 4.15, 78.8%) significantly less than Internet acceptable use policies. Teacher rewards was seen as a significantly more important issue than teacher job

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security by respondents. It was ranked 12th in importance for effective ICN use (Mn = 4.18, 74.5%). Lowest-rated of all named issues was teacher job security, ranked 15th (Mn = 3.33, 48.1%), the only item on which a simple majority did not agree on importance.

Current adequacy

The principals surveyed were also asked to indicate their level of agreement with the statement, "This issue is currently being adequately addressed" for each of the 15 named issues. Table 2 ranks their level of agreement by mean score. The rankings for current adequacy on the 15 named issues differed substantially from those for perceived importance. Only 6 of the 15 named issues garnered over 50% agreement that they were currently being adequately addressed.

Table 2
Perceived Current Adequacy of Named School Policy Issues for Effective ICN Use, Ranked By Mean Score (1)

Rank	Variable	Mean	SD	N	% Agree (2)
1	Teacher/Administrator Internet Training	4.10	1.35	52	69.2
2	Student Internet Training	4.08	1.38	52	69.2
3	Internet Acceptable Use Policy	4.06	1.38	52	67.3
4	Teach./Admin. Video Classroom Training	3.75	1.30	52	59.6
5	Technical Support for Hardware, Software, ICN Network Usage	3.65	1.28	51	54.9
6	Copyright Use Guides	3.58	1.19	52	53.8
7	Teacher Job Security Concerns	3.48	1.51	52	48.1
8	ICN Classroom Site Cost Determination/ Billing	3.40	1.38	52	50.0
9	Student Video Classroom Training	3.38	1.32	52	50.0
10	Supervision, Proctoring, After-Hours Staffing	3.35	1.31	51	49.0
11	School/ICN Video Classroom Closings, Session Cancellations	3.17	1.26	52	42.3
12	Matching ICN courses with Best Available Sites	3.04	1.24	52	38.5
13	Teacher Rewards	2.92	1.25	52	22.7
14	Common Semesters	2.08	1.15	51	9.8
15	Common Bell Schedules	2.08	1.06	51	7.8

(1) Attitudes toward items on a scale ranging from "1" = "Strongly Disagree" to "6" = "Strongly Agree"
(2) Cumulative percentage, respondents replying "4" = "Moderately Agree," "5" = "Agree," or "6" = "Strongly Agree"

Training Issues. The top-ranked issues in terms of agreement on current adequacy were teacher and administrator Internet training, ranked 1st (Mn = 4.10, 69.2% agreed), and student Internet training, ranked 2nd (Mn = 4.08, 69.2%). Teacher and administrator video classroom training was ranked 4th (Mn = 3.75, 59.6%). Student video classroom training was ranked 9th (Mn = 3.38, 50.0%).

Teaching issues. A majority agreed on current adequacy for the two named issues regarding written policies, Internet AUPs, ranked 3rd (Mn = 4.06, 67.3% agreed on importance) and copyright use guides, ranked 6th (Mn = 3.58, 53.8%). However, only 22.7% of respondents agreed that teacher rewards (Mn = 2.92, ranked 13th) were being adequately addressed. In contrast to teacher rewards, teacher job security concerns (Mn = 3.48, ranked 7th) were seen to be adequately addressed by 48.1% of responding principals, the same percentage as rated job security an important issue. Job security was the only issue for which scores on importance and current adequacy did not significantly differ (.05 level).

Support issues. While a majority (54.9%) agreed that technical support (Mn = 3.65, ranked 5th) was currently adequate, slightly less than half (49.0%) felt that staffing issues (Mn = 3.35, ranked 10th) were currently being adequately addressed.

Coordination Issues. The lowest-ranked issues, in terms of respondent's agreement that they were currently being adequately addressed, were common bell schedules, ranked 15th (Mn = 2.08, 7.8% agreed) and common semesters, ranked 14th (Mn = 2.08, 9.8%). Mean scores for these two issues were significantly lower than for the other 13 named issues in terms of current adequacy. Other coordination issues were also seen as adequately addressed by less than a majority of respondents, although not as much as bell schedules and semesters. These included matching ICN courses with sites, ranked 12th (Mn = 3.04, 38.5%), session cancellations and closings, ranked 11th (Mn = 3.17, 42.3%) and ICN cost/ billing, ranked 8th (Mn = 3.40, 50.0%).

Importance versus current adequacy

Identifying priorities for action. Paired T-Test comparisons were performed to determine the significance of differences between respondent perceptions on the importance and current adequacy of named school policy issues. The resulting ranking may be more useful than either importance or current adequacy rankings alone in identifying priorities for action on the 15 named issues.

Table 3
Named School Policy Issues: Perceived Importance Versus Current Adequacy, Ranked T-Test Paired Comparisons (1)

Rank	Variable	T	Mean	SD	df	p (2-tl)	95% CI
1	Common Semesters	11.13	2.98	1.91	50	.000	(2.44, 3.52)
2	Common Bell Schedules	10.80	2.84	1.88	50	.000	(2.31, 3.37)
3	Matching ICN courses with Best Available Sites	8.01	1.85	1.66	52	.000	(1.38, 2.31)
4	Teacher/Administrator Video Classroom Training	6.92	1.38	1.44	51	.000	(.98, 1.79)
5	Supervision, Proctoring, After-Hours Staffing	6.01	1.50	1.76	49	.000	(.99, 2.00)
6	School/ICN Video Classroom Closings, Cancels	5.11	1.25	1.75	50	.000	(.76, 1.75)
7	Teacher Rewards	4.47	1.22	1.94	50	.000	(.67, 1.76)
8	Technical Support for Hardware, Software, ICN	4.45	1.06	1.68	49	.000	(.58, 1.54)
9	Teacher/Administrator Internet Training	4.26	.90	1.51	50	.000	(.48, 1.33)
10	Internet Acceptable Use Policies	4.22	.75	1.28	51	.000	(.39, 1.11)
11	ICN Site Cost Determination/ Billing	2.64	.83	2.26	51	.011	(.20, 1.46)
12	Student Video Classroom Training	2.46	.63	1.86	51	.017	(.12, 1.15)
13	Student Internet Training	2.45	.52	1.53	51	.018	(.09, .94)
14	Copyright Use Guides	2.36	.57	1.72	50	.022	(.08, 1.05)
15	Teacher Job Security Concerns	-.50	-.15	2.22	51	.620	(-.77, .47)

(1) Attitudes toward items on a scale ranging from "1" = "Strongly Disagree" to "6" = "Strongly Agree"

(2) Cumulative percentage, respondents replying "4" = "Moderately Agree," "5" = "Agree," or "6" = "Strongly Agree"

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Table 3 shows the significance of differences between mean scores on importance and perceived adequacy on the 15 named issues, as revealed though paired T-Tests. Issues were ranked from the highest T-value and greatest significance (largest differences) to the lowest T-value and least significance (smallest differences). Mean scores on current adequacy were significantly lower than mean scores on importance (.05 level) for 14 of 15 named issues. For 10 of 15 named issues, the probabilities were less than one in 1000 ($p < .001$) that the differences between mean scores were due to chance alone.

Coordination Issues. The top three issues in all coordination issues. The greatest differences between importance and adequacy ratings were for common bell schedules, ranked 1st (Mn = 2.98, T = 11.13) and common semesters, ranked 2nd (Mn = 2.84, T = 10.80). Not far behind was matching ICN courses with sites, ranked 3rd (Mn = 1.85, T = 8.01). Differences in importance versus current adequacy ratings were less for session cancellations and closings, ranked 6th (Mn = 1.25,T = 5.11) and ICN cost/billing, ranked 11th (Mn = .83, T = 2.64).

Support issues. The two named support issues also ranked high in terms of importance versus current adequacy. Staffing ranked 5th (Mn = 1.50, T = 6.01) and technical support ranked 8th (Mn = 1.683, T = 4.45).

Training issues. Importance versus adequacy rating comparisons showed greater differences for teacher and administrator training issues than for student training issues. Highest in significance was teacher and administrator video classroom training, ranked 4th (Mn = 1.38, T = 6.92), while teacher and administrator Internet training was ranked 9th (Mn = .90, T = 4.26). Student video classroom training (Mn = .6346, T = 2.46) and student Internet training (Mn = .5192, T = 2.45) were ranked 12th and 13th respectively, but importance and adequacy ratings on these items still showed significant differences at the .05 level.

Teaching issues. As a group, issues related to written policies, rewards and job security for teachers showed the least differences between importance and adequacy ratings. However, there still were significant differences (.05 level) between ratings for three of four of these issues. Teacher rewards were ranked 7th (Mn = 1.22, T = 4.47). Internet acceptable use policies (Mn = .75, T = 4.22) ranked 10th in importance versus adequacy, while copyright guidelines (Mn = .57, T = 2.26) ranked 14th. Teacher job security concerns (Mn = -.1538, T = -.50) came in last among the 15 named issues. It was the only paired comparison for which there was no significant difference between importance and adequacy ratings ($p = .62$).

Other Findings

School, District, and Community Size. Respondent perceptions sometimes differed significantly on issues when grouped by high school enrollment. Here smaller high schools were defined as those with less than 400 students, and larger high schools as those with 400 or more students. Preliminary analyses showed few significant differences ($p \leq .05$) by community size.

School size and named policy issues. Principals of larger schools rated the importance of student video training less highly than did principals of smaller schools. Ratings of the importance of student video training were negatively correlated with high school size. R (N = 52) = -.46, $p < .001$. Larger-school administrators had greater concerns about the adequacy of staffing for ICN video classroom and Internet. Perceptions that staffing issues was currently being adequately addressed were also negatively correlated with larger schools. R (N = 51) = -.37, p = .008. Principals of smaller schools were less concerned about common bell schedules and semesters than were larger school principals. Strength of agreement that common bell schedules were currently adequate was negatively correlated with enrollments of 400 or more. R (N = 51) = -.34, p = .01. A similar significant negative correlation was apparent for common semesters. R (N = 51) = -.28, p = .05.

Length of professional experience. Length of experience in pK-12 teaching was not associated with any significant differences in administrator views on policy issues. Years of experience as a building principal were associated with some borderline significant differences. For example, principals with five to 20 years of experience agreed more strongly than others that their teachers supported Internet use. $c2 (9, 53) = 15.02$, p = .09. However, experience as a building principal did not differ by school size.

Length of time operational. The length of time a school had had an Internet connection or operational ICN classroom was not found to be significantly related to any differences in policy perceptions. School size did not appear related to time with an operational video classroom. There was a weak relationship between school size and length of Internet access, however. Linear association c2 (1,53) = 2.56, p = .11. Eight of 24 smaller schools (33%) had been online a year or less, according to respondents, compared with 3 of 26 larger schools (11.5%).

Gender. Due to the small size of the survey population and limited number of female respondents (N = 6), the few significant relationships apparent between named issues and the gender of administrators must be approached very cautiously. Female respondents were more likely to agree that student Internet training was currently adequate. R (5, 52) = -.27, p = .05. Other gender-related differences significant at the .05 level were not apparent. Female respondents had less experience as building principals, but not significantly so. (2 (3, 53) = 5.53, p = .13.

Calendar systems. The large majority of respondents (83.0%) reported that their schools used a semester system, while only 15.1% reported use of quarter systems. About 24.5% reported use of a block or modified block scheduling systems. While larger and smaller schools were equally likely to use a semester system, larger schools were significantly more likely to use block scheduling. c2 (2,53) = 5.82, p = .05. Ten of 26 larger schools (38.5%) were using block or modified block scheduling, compared with only 3 of 27 smaller schools (11.1%).

Personal knowledge, school involvement. The same personal knowledge and school involvement questions were asked by Abel and Hays in their 1996 study of the same survey population. Although the actual dataset of the 1996 study was not available for comparison, face comparisons can be made of responses on these two questions. The response rate for Abel and Hays' 1996 survey (88.8%) could not be duplicated in the present survey (72.6%), but was nevertheless high enough to expect results generalizable to the sample population.

Mean scores on knowledge of distance education were about the same in the 1997 survey (Mn = 3.55, SD = .67, N = 53) and the 1996 survey (Mn = 3.53, SD = .71, N = 64). Respondents who claimed "very little" knowledge of distance education decreased from 6.3% in 1996 to 1.9% in 1997. However, the percentage who indicated they had "quite a bit" of knowledge of distance education also decreased, from 46.9% to 41.5%, while those claiming "some" knowledge increased from 40.6% to 49.1%. The percentage claiming the most knowledge—"extensive" knowledge—rose slightly, from 6.3% to 7.5%.

Mean scores on school involvement in distance education were not significantly lower in the 1997 survey (Mn = 3.08, SD = .81, N = 53) than in the 1996 survey (Mn = 3.24, SD = .96, N = 64). No respondents reported that their schools were not involved at all in distance education in 1997, while two schools (3.1%) had done so in 1996. Percentages reporting "quite a bit" of school involvement in distance education decreased from 32.8% to 18.9%, while those reporting "some" school involvement rose from 35.9% to 52.8%. Those reporting "very little" involvement rose from 18.8 to 22.6%. Smaller and larger schools did not differ in perceived involvement in distance education in the 1997 survey. c2 (3,53) = 2.22, p = .53.

Support for/access to ICN video and Internet. Principals were also surveyed on their perceptions of teacher and administrator support for use of ICN video and Internet at their schools, and their perceptions about the adequacy of student and teacher access to these technologies. These items did not fit an importance versus current adequacy format, but were included for possible use in identifying additional differences in administrator perceptions. About 92.5% of responding principals agreed that their school's administration supported the use of distance education (Mn = 5.06, SD = 1.08, N = 53). A smaller percentage (71.7%) agreed that their school's teachers supported distance education use (Mn = 4.15, SD = 1.13, N = 53). Mean scores differed significantly. Mn = -.91, T = -6.02, DF = 52, p < .001.

All respondents but one (98.1%) felt that both teachers and administrators supported Internet use. Respondents strongly agreed that school administration was supportive of use of the Internet (Mn = 5.46, SD = .90,.N = 53), but while they also agreed that teachers were

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supportive, the agreement was less strong (Mn = 5.25, SD = .90, N = 53). Mean scores differed significantly. T = -.264, Mn = -.19, DF = 53, p = .01. While practically all respondents said their school administration supported Internet use, those at larger schools indicated administrators were more strongly supportive. c2 (3,52) = 10.53, p = .01. Twenty-one of 26 responding larger school principals (80.8%) chose "strongly agree", on this item, compared with 11 of 26 smaller school principals (42.3%). About 83% of respondents agreed that Internet access at their schools was currently adequate for teachers. Mn = 4.75, SD = 1.43, N = 53. Student Internet access was seen as adequate by 77.4%. Mn = 4.566, SD = 1.43, N = 53. Respondents were significantly less likely to agree that student access to ICN video courses was currently adequate, although a majority (56.6%) felt that it was. Mn = 3.81, SD = 1.32, N = 53. A slightly but not significantly higher percentage (64.2%) agreed that access to the ICN video system for staff development and administrative uses was adequate. Mn = 3.89, SD = 1.24, N = 53. There was a strong negative correlation between school size and perceived adequacy of student Internet access. R (5.53) = -.32, p = .02. While 25 of 27 (92.6%) of smaller school principals felt Internet access for students was currently adequate, only 16 of 26 (61.5%) of larger school principals shared this view. There was a strong negative correlation between high school size and perceptions of the adequacy of student ICN course access. R (3,53) = -.32, p = .02. Only 11 of 26 principals at larger higher schools (42.3%) agreed student access to ICN courses was currently adequate, while 19 of 27 smaller school principals (70.4%) agreed.

Content Analysis, Open Ended Questions

The third section of the questionnaire consisted of two open-ended response items. Respondents were asked to list as many issues as they felt were appropriate for two open-ended questions. Responses were aggregated into issue categories. The frequency of issues cited in these open-ended responses fit well with the statistical analysis of answers to closed-ended questions.

Key issues faced since completion. The first open-ended question was, "Based on your own experience, what are the key related issues you have faced as a principal, since your school completed its ICN connection/ICN video classroom?" Overall, 46 of 53 (86.8%) of those responding to the survey provided a usable response to the first open-ended question.

Thirty-one of 46 (67.4%) of those responding to the first open-ended question mentioned coordination issues. The term "schedule" or "scheduling" was used by 19 respondents. For many, this was a shorthand way of referring to a variety of coordination difficulties. Difficulties establishing a common schedule with other schools for ICN video classroom courses were mentioned by 13 respondents, two of whom specifically mentioned difficulties with block scheduling. Eight mentioned internal class scheduling difficulties at their schools related to ICN use. Eight also mentioned difficulties in sharing course information or coordinating with other schools. Four specifically cited the lack of common calendar systems.

Seventeen of 46 (37%) of those responding to the first open-ended question mentioned staffing-related issues, either explicitly or implicitly. Four administrators cited difficulties with the "fit" between their students and ICN course offerings. Eleven of 46 (23.9%) mentioned issues related to teaching over the ICN. Four of these mentioned encouraging use of the system for teaching and other activities as important, while three specifically mentioned teacher training. Three mentioned teacher rewards, including two who referred specifically to teacher pay issues. One said that the school's teachers felt negatively about ICN classes because their students had a "harder time", probably in courses where their site was not the originating site.

Seven of 46 respondents (15.2%) to the first open-ended question mentioned issues related to use of ICN classes for curriculum enhancement at their schools. Four respondents (8.7%) cited difficulties accessing courses wanted at their schools. Seven respondents (15.2%) mentioned technical, equipment or system capability issues. Only three (6.5%) mentioned specific technical issues, such as malfunctioning equipment.

Key issues for those acquiring ICN connection. The second open-ended question was, "Based on your own experience, what are the key related issues facing a principal whose school is acquiring an ICN connection/ICN video classroom?" Overall, 37 of 53 (69.8%)

of those responding to the survey provided a usable response. Most frequently cited as important issues for principals acquiring an ICN connection were staff development/teacher training and construction/technical/equipment related issues (both cited by around 35%).

The principals supported staff development and teacher training for system use early in the process, perhaps sharing the sentiment that this was crucial to "getting the room used—when its done". A few respondents each cited construction delays or equipment problems, but most frequently their construction-related answers concerned decisions related to room installation. Some gave highly specific advice for principals planning new ICN rooms, such as "Placement of room to limit building access for ICN room usage." ..."Outside telephone line access in ICN room." ... "Access to restroom during non-school hours."

Following staff development and construction concerns as key issues in planning for ICN use were leadership activities, scheduling issues, and staffing/supervision issues, each of which was mentioned by around 22% of those responding. Leadership activities to obtain support, such as visioning or strategic planning, were named as key issues by eight respondents. For example, one principal gave as a key issue "Getting teachers, parents & students excited about the possibilities. Sharing the vision and having a positive experience right away." Another was more blunt, naming as a key issue " 'selling' the ICN to instructional staff."

Issues of staffing and supervision were also cited by eight principals, half of whom directly or indirectly named their own increased time commitment and responsibility. For example, "One more responsibility of the principal in a lot of cases—especially when outsiders use the system." Or, "It does take a lot of someone's time to make sure the building is open and the room is available for installation of equipment, etc." Scheduling and coordination issues were also cited by eight principals. Only one respondent explicitly named as a key issue for principals acquiring an ICN classroom the "coordination of classes offered" with others.

Discussion

Coordination Issues

Issues requiring coordination with external parties yielded the greatest "is/should be" discrepancies in respondent perceptions, topped by common bell schedules and common semesters. However, given the largely semester-based calendar systems and non-block schedules of surveyed schools, it is likely that many of the shared course programming problems between schools arise from differences in starting and ending dates or times, not from conflicts between semester and quarter systems, or conflicts between block and non-block scheduling. Together with staffing issues, coordination issues probably interacted with the sense of principals that they had local control of their schools.

Training issues

Clearly, training teachers and administrators in use of ICN video classrooms and the Internet were very important issues for respondents, while student Internet training was also seen as moderately important. However, it appears likely that for some principals who had not yet put many resources into Internet, it was simplest to report that Internet training and access was currently adequate, even if they rated them important issues "down the road."

Despite the relatively high level of agreement on the current adequacy of teacher and administrator ICN video classroom training, the ranking of this issue as most important still left a substantial gap between the "is" and "should be" perceptions of respondents. However, a majority of responding principals agreed that video classroom training was currently adequate. While this is probably due at least in part to internal school efforts, this finding by external researchers lends support to the internal evaluations of the Iowa Distance Education Alliance's training programs, which have shown teacher satisfaction with training.

Support issues

Staffing was an important concern for larger school principals. The video classrooms of these schools, located in larger communities, are often used a great deal outside of school

hours by authorized users not originating their programming from the school's site. These larger schools are probably also more likely to have networked computer labs requiring staffing during and/or outside regular school hours. Each of Iowa's education regions has established a policy for site fees, beyond network costs, which schools can charge to recover part of their staffing costs, but the charges allowed are variable and probably play a role in administrator attitudes.

Teaching Issues

Teacher rewards were clearly an important issue for the future in the views of responding principals, although not as pressing as coordination, staffing or teacher video training issues. Job security was seen as a "non-issue" by a majority of respondents. However, a substantial minority considered it an important issue.

Other Issues

Respondents were not asked to specify for their school's current levels of training or degree of Internet access (percent of classrooms with access, type of connection, etc.). Some administrators may have seen low levels of Internet access and training as relatively adequate.

Comparison of 1996 and 1997 responses

Moderation of responses

It was interesting to see the apparent moderation of responses from the 1996 Abel and Hays study to the present 1997 study, on the two questions that were identical in both survey instruments. These items asked respondents to rate their personal knowledge of distance education, and their school's involvement in it. The reason for the shift by many from "quite a bit" to merely "some" knowledge/school involvement from the 1996 to 1997 surveys probably combines several factors. Some of the more enthusiastic principals may have not responded to the second (1997) survey, which achieved a respectable but lower 72.6% response rate, when compared with the 88% response rate of the 1996 survey. Also, the subject content of the survey instruments may have somewhat colored responses. Another possibility is that as principals gained more experience and networked with their peers, they saw their own knowledge and their school's involvement in a larger context. Other possible explanations for the slightly lower reported school involvement from 1996 to 1997 include a decrease in use of some high school ICN classrooms as more sites became operational, and less effort by some schools to coordinate with others and originate courses.

Origination versus participating site issues

For their 1996 study, Abel and Hays obtained figures from Iowa Public Television on how many ICN video courses were originated and how many were received in May 1996 by the high schools whose principals acted as the survey population. Principals of these same schools acted as the survey population for the present study. Abel and Hays did not find any significant differences in perceived school or principal innovativeness based on origination or receive site status for ICN courses. However, they found that in May 1996, the 73 schools whose principals were surveyed originated 46 courses over the ICN, while acting as non-originating or participating sites for 315 courses, a ratio of nearly seven to one.

For smaller schools, which sought to enrich their curriculum, being "net importers" might be welcomed. For larger schools, however, with less need to supplement curricula, importing courses might have less appeal. Principals at these schools may be more likely to see their facilities used as "regional sites" for postsecondary courses for which their high school students are not a primary audience.

Conclusions and Recommendations

Research needed

The present study suggests a need for further research. For example, longitudinal analyses of teacher and administrator attitudes at the hundreds of schools with ICN classroom sites and Internet connections could be quite helpful in measuring the degree to educational

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policy issues are adequately addressed over time. Research on Internet use is greatly needed along with research on ICN video classroom use.

The results of the present study should help inform educational policy decision-makers of the range of perceptions of local school administrators on important distance education policy issues. Some general recommendations:

—Find ways to involve building level administrators in the ICN policymaking process, in order to encourage continued active participation and effective use of the ICN;

—Engage in dissemination and networking practices aimed at administrators as well as teachers, through institutes, workshops, Internet activities and other methods, in relation to the policy issues surrounding ICN video classroom and Internet use.

Priorities for action

Policymakers may find the following recommendations useful in addressing specific issues identified as priorities for action by principals:

—Promote early planning for coordination of courses and curricula;

—Promote identification and peer-to-peer networking, district by district and statewide, of schools sharing the same calendar and scheduling systems;

—Promote strategies for coordination of courses and curricula between schools with dissimilar calendar and/or scheduling systems;

—Promote internal ICN/Internet training and supervision/staffing models for schools;

—Disseminate successful teacher reward and negotiation models, and model ICN classroom/Internet acceptable use policies.

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An Investigation of Potential Access to Role Models for At-Risk Females Using the Iowa Communications Network

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Introduction

Since World War II, the overall percentage of women in the workplace has consistently grown as they sought to meet the financial needs of their families, improve their lot in life, and secure the intrinsic and extrinsic rewards that most employment situations offer. However, there are enduring problems with American women's employment situation: women comprise 45.6 percent of the total U.S. labor population but earn only seventy-five cents for every dollar that men earn when education levels are held constant (Department of Labor, 1996), and in Iowa the ratio is sixty-eight cents for every dollar (Igbokwe, 1993). Women also tend to cluster in a very limited number of occupations that traditionally are low wage and/or low skill jobs (Department of Labor, 1993a). In Iowa, men dominated 237 of 496 occupational categories (47.8%), while women dominated only 73 (14.7%) of 496 categories as based on U.S. Census Bureau statistics for 1994 (Iowa Commission on the Status of Women, 1996).

This would seem to support the contention that social pressure on women and girls to conform to a limited range of workplace roles is still a problem in Iowa, the Midwest, and the United States in general. Indeed, the career selection choices of young women today continue to gravitate toward more traditional roles such as clerical worker, food service worker, domestic or household helper, or health care provider (Eccles, 1994). In these fields, pay is generally low, promotion opportunities are few, and turnover rates can be high. Gender role expectations and personal experience can have a dampening effect on young women's career choices.

The evolution of social expectations regarding gender work roles is painfully slow, but there are incentives for change. Nontraditional careers for women pay higher wages and have more advancement opportunities, the American workforce in the next ten years will undergo broad demographic change, and public policy initiatives are forcing many women on assistance to seek employment (Department of Labor, 1993b). For some, the ability to aspire to a different paradigm than the status quo can be sparked by chance or by direct purpose. The benefit of information exchanges and support from positive role models, advice from women in nontraditional roles, or persons in influential positions have been documented as having a positive impact on young women's career selection (Hall, 1997; Sandler, 1992).

One of the barriers to interaction between protégées and role models is access. How do young women find positive role models, especially those who are in poverty, undereducated, and/or socially isolated? Would the Iowa Communications Network (ICN) be a plausible conduit for information exchanges? Are special incentives necessary to bring potential role models and at-risk women together on the ICN?

As the ICN is linked to more sites across the state, the problems with scheduling and usage rights also emerge. Is it a worthwhile effort to do the extensive paperwork to reserve time on the ICN, only to have either group become reticent about using the technology? How comfortable are these groups with the ICN fiber-optic technology? How do these groups perceive the ICN as a communication tool? There is a need to discover what knowledge and perceptions these two groups have regarding using the ICN as a link to positive career goal choices and aspirations for a better life.

Objectives of the Study

The purpose of this study was to collect data on the feasibility of using the ICN to facilitate information exchanges between potential role models and at-risk women from across the state.

The specific objectives were to:

- Identify the beliefs regarding occupational choices of young women that were held by role models and persons knowledgeable about at-risk young women.
- Characterize the perceptions about the need for role models for at-risk women, experiences with role models, and interest in becoming a role model.
- Describe the attitudes held by these groups with regard to the ICN and its potential for use as a communication tool.
- Identify barriers to using the ICN for role model and protégé information exchanges.

Method

The design of the study was descriptive, that is, it did not seek to predict or show causation, rather it proposed only to describe what is at this point in time. A twenty-five item questionnaire was developed consisting of four sections: occupational choices for young women (seven items), role models for young women (nine items), Iowa Communications Network knowledge and perceptions (nine items), and demographics. Space for additional open comments was provided. The instrument was developed following an extensive literature review and with particular emphasis on previous studies regarding ICN usage. The questionnaire was pilot-tested by students in a distance education workshop for Family and Consumer Sciences professionals at Iowa State University. In addition, the instrument was reviewed by a panel of experts experienced in distance education research. The groups reviewed the instrument for suitability, content and construct reliability.

Population and Sample

The first population for the study consisted of males and females who had an interest in the economic and social well-being of women in Iowa. These persons would ideally be predisposed to serve as role models or mentors to young women from a variety of socio-economic, cultural, and racial backgrounds. The Iowa Future$ Project speaker pool (n=91) was selected as a representative sample for the population based on their commitment to addressing economic issues affecting Iowa women's career choices.

The second population was determined to be young women in Iowa in need of career choice information, mentoring, or positive role models, particularly those in or heads of families on public assistance. Since identifying women to contact who met these criteria was difficult without breach of privacy, the sampling frame for the study focused on Iowa Department of Human Services (DHS) personnel. Regional directors, workforce development personnel, vocational counselors, JPTA and Promise Jobs coordinators, and Family Investment Program personnel (n=120) were randomly selected from DHS personnel listings with care that all geographic areas of the state were represented.

Data Collection

The data were collected by mailed questionnaire. A cover letter, survey questionnaire, and a stamped return envelope was sent to the two samples with a request to respond within fifteen days. Response rates for the Iowa Future$ group was fifty-five percent and forty-nine percent for the DHS personnel. Telephone follow up of non-respondents indicated no significant differences from the respondents.

Results

Of the returned responses, 109 were usable by the researcher. The mean age range for both groups of respondents was forty-one to fifty years of age with thirty-three percent (36) of all respondents in this category. Ninety-two (84.4%) of the respondents were female and the average education level was greater than a four-year degree with 24.8% (27) having achieved a masters degree and 8.3% (9) achieving doctorates. An overview of group demographics can be found in Tables 1 and 2.

Table 1 & 2. Demographic frequencies and percentages for Iowa Future$ (IF) and Dept. of Human Services (DHS) personnel.

AGE: frequency (percent of total)

GROUP	*22-30*	*31-40*	*41-50*	*51-60*	*61-70*	*71-100*
IF	4 (3.7%)	12 (11%)	12 (11%)	5 (13.8%)	5 (4.6%)	2 (1.8%)
DHS	2 (1.8%)	14 (12.8%)	24 (22%)	17 (15.6%)	2 (1.8%)	0 (0%)

EDUCATION: frequency (percent of total)

GROUP	*HS*	*AA*	*SOME COLLEGE*	*BA, BS*	*SOME GRADUATE*	*MA,MS*	*PH.D.*
IF	0 (0%)	0 (0%)	1 (0.9%)	6 (5.5%)	13 (11.9%)	21 (19.3%)	9 (8.3%)
DHS	6 (5.5%)	1 (.9%)	16 (14.7%)	18 (16.5%)	12 (11%)	6 (5.5%)	0 (0%)

On a seven-point Likert-type scale, where negative three equated strongly disagree, zero represented neutral and positive three equated strongly agree, the respondents were asked to indicate their level of agreement or disagreement to twenty-three statements on occupational choices, role models, and the ICN. T-tests were used to determine whether there was a significant difference between the two groups on a variety of statements regarding these issues.

Results indicated that there were significant differences at the .05 level between the groups on three of the occupational choice statements as illustrated in Table 3. None of the respondents indicated that young women should not consider nontraditional career options. T-values for the set of statements on role models for young women revealed that the groups had divergent views on six of the eight reaction statements (see Table 4). Ninety-eight percent (107) agreed that a role model can have an impact on a young woman's career choices. Eighty-nine percent (87) concurred that a role model could be male or female and fifty-one (46.8%) had mentored a young woman. Of both groups, forty-nine (45.4%) had a role model. Some of the written comments indicated that a role model could be positive or negative and that the effects of either on young persons were wide-reaching.

Table 3. T-test results for occupational choice statements.

STATEMENT	*GROUP*	*N*	*M***	*T-VALUE*	*PROB.*
1. Young women need more information about potential future careers.	IF	50	2.740	3.97	0.000
	DHS	59	2.102		
2. Young women have become more aware about occupational choices due to programs in school.	IF	50	1.327	1.72	0.089
	DHS	59	1.000		
3. Most young women will only consider traditional women's careers.	IF	50	.326	-0.51	0.613
	DHS	59	.463		
4. Young women with children have fewer occupational choices available to them.	IF	50	1.404.	2.43*	0.017
	DHS	59	.706		
5. Young women should be encouraged to consider more technical careers.	IF	50	2.540	1.76	0.081
	DHS	59	2.237		
6. If given an opportunity to learn about other women's careers, young women would set their career goals differently.	IF	50	2.140	2.69*	0.008
	DHS	58	1.569		

* Significant at the .05 level

** Positive numbers indicate agreement with the statement.

Table 4. T-test results for role model statements.

STATEMENT	*GROUP*	*N*	*M***	*T-VALUE*	*PROB.*
1. Role models for young women are very important.	IF	50	2.840	3.02*	0.003
	DHS	59	2.424		
2. I had a role model who influenced my career selection.	IF	50	1.089	2.05*	0.043
	DHS	50	.392		
3. Young women need role modes in nontraditional careers to influence their career choices.	IF	50	2.500	3.83*	0.000
	DHS	59	1.780		
4. A role model can have an impact on the career choices young women make.	IF	50	2.520	2.97*	0.004
	DHS	59	2.068		
5. Role models for young women in remote rural areas or inner city neighborhoods are difficult to find.	IF	50	1.938	2.42	0.017
	DHS	59	1.304		
6. Most role models for young women are their teachers or family members.	IF	50	1.980	1.96	0.095
	DHS	58	1.649		
7. Role models for young women can be male or female.	IF	50	1.531	-.48	0.635
	DHS	59	1.655		
8. I am interested in being a role model for young women.	IF	50	1.792	3.46*	0.001
	DHS	58	.909		

* Significant at the .05 level

** Positive numbers indicate agreement with the statement.

The last section of the survey questionnaire focused on the knowledge, perceptions, and attitudes toward ICN usage in general, and the feasibility of a communications tool for career choice information for young women specifically. One hundred and six (97.2%) knew what the ICN was and ninety-six (88.1%) had participated in an ICN session. Only eighteen (16.6%) of the respondents expressed discomfort with using the ICN and forty-four (40.4%) indicated they were very comfortable with the technology.

Table 5 reports the t-scores for the ICN portion of the survey and Table 6 breaks the data out into response frequencies for IF and DHS personnel. The results indicated that both groups agreed that the ICN was a good communications tool and that they were both knowledgeable and comfortable with the technology. However, both groups were close to neutral on the statement that young women would be willing to use the ICN for career choice information having mean scores of -0.182 and 0.315.

Discussion

Occupational Choices for Young Women

The results of the study indicate that the two groups surveyed have some reservations about using the ICN as a communications tool for young women and role models to exchange information. The Iowa Future$ group was more strongly inclined to believe that young women needed more information regarding careers than did the DHS personnel. The DHS personnel indicated that they believed that young women did not have fewer occupational choices afforded to them, in contrast to the beliefs held by the IF group. DHS employees also were less inclined to entertain the idea that young women would set their career goals differently if given the opportunity. The differences between the two groups on these three issues seem to indicate that the IF group is more optimistic about the possibility for affecting young women's career decisions.

Table 5. T-test results for ICN knowledge and perception statements.

STATEMENT	*GROUP*	*N***	*M*	*T-SCORE*	*PROB.*
1. The ICN would be a good tool to bring young women and role models together to share information.	IF	47	1.681	-.11	0.916
	DHS	59	1.707		
2. A better use of the ICN would be to deliver career guidance education in a classroom format.	IF	47	1.133	-1.47	0.144
	DHS	58	1.518		
3. Young women in need of role models would be interested in using the ICN to gain information.	IF	47	.725	-2.24*	0.027
	DHS	59	1.254		
4. Young women would not participate in an ICN session unless they were coerced to do so.	IF	47	-.182	-1.72	0.089
	DHS	59	.315		
5. The use of the ICN to influence young women's career objectives is a good idea.	IF	47	1.767	1.83	0.071
	DHS	59	1.373		
6. I would be willing to participate in an ICN role model session.	IF	50	1.260	2.35*	0.021
	DHS	59	.574		
7. I am uncomfortable with using the ICN to communicate with persons in other areas of the state.	IF	50	.269	.37	0.710
	DHS	59	.410		

* Significant at the .05 level

** Respondents with no knowledge of the ICN were asked to skip forward to last two statements.

Table 6. Response frequencies for ICN knowledge and perceptions.

STATEMENT #	*GROUP*	*STA**	*A**	*SA**	*N**	*SD**	*D**	*STD**
1. ICN is a good tool for sharing information ...	IF	15	14	9	6	3	0	0
	DHS	23	10	13	9	3	0	1
2. A better use for ICN is for career guidance.	IF	10	8	10	14	1	2	1
	DHS	14	16	14	10	1	1	2
3. Young women would be interested in the ICN...	IF	5	7	10	20	5	0	0
	DHS	12	14	14	16	2	1	0
4. Young women would not participate...	IF	1	4	8	14	7	10	3
	DHS	5	10	5	17	11	6	5
5. ICN to influence career decisions is good idea...	IF	14	14	13	6	0	0	0
	DHS	13	14	17	12	3	0	0
6. I would be willing to participate...	IF	15	10	9	9	3	4	0
	DHS	7	6	10	23	4	4	5
ICN session.	**IF**	**3**	**2**	**4**	**3**	**4**	**10**	**24**
7. I am uncomfortable with using the ICN...	DHS	1	1	7	11	10	9	20

*Key: STA (strongly agree), A (agree), SA (somewhat agree), N (neutral), SD (somewhat disagree), STD (strongly disagree).

The DHS personnel were less keen on the idea that young women should consider nontraditional occupations and were more positive about the statement regarding young women's preference for traditional careers. This may be the result of the working environment that these people encounter, in that, they may have contact with clients who are more interested in traditional (i.e. less risky) job opportunities. Supporting this is the fact that the IF group as a whole had higher education levels than the DHS personnel, and were employed in a wide variety of occupations. Those persons who believed firmly in the concept of improving women's economic situations enough to volunteer for the group may have more to do with self-confidence and successful occupational outcomes that they may have experienced.

Overall, the DHS group tended to perceive that at-risk young women are aware of their career options, that these women might change their career goals, and nontraditional careers weren't as highly approved of as more traditional jobs. On all these points, the IF group were stronger in agreement with nontraditional career paths and the need for more career information.

Role Models for Young Women

In this portion of the instrument, there were more significant differences between the two groups than on any other section. It should be noted that the differences were more commonly on the degree of agreement on the role model statement rather than differences in agreement versus disagreement for any particular group. In each case of a significant difference, the IF group responded in much stronger agreement with the statement than the DHS personnel. The IF group perceived that: role models are very important, they had positive experiences with a role model, young women need role models in nontraditional careers, and that a role model can affect career decisions. The divergence between the groups on the willingness to be a role model might be explained by the job parameters by which DHS employees are limited. That is, they are expected to interact professionally with a large number of clients on a daily basis and may be limited by office policy from becoming involved with their clients. They also may be indifferent to the need for emotional support and advice that young at-risk women require because this is essentially what they do for a living. The IF group was much more likely to confirm their willingness to serve as a role model.

Both groups concurred that teachers and/or family members were likely to be role models for young women, but also agreeing that role models for women in rural or inner-city environments were difficult to find. The IF group was in less agreement with the statement that role models could be male or female. Does this show that same sex role model/protégé interactions are a natural assumption or did the higher number of men in the DHS group skew the data? A check of the responses to this statement by gender showed that fifteen of the seventeen men responding to the survey agreed that role models could be male or female, none disagreed. Among the women, twelve disagreed that role models could be male or female.

Iowa Communications Network Knowledge and Perceptions

A large majority of the respondents had previous knowledge of the ICN and 88.8% had participated in an ICN session. The DHS personnel as a group had higher overall participation rates which may be a direct result of Iowa public employees higher access to the technology. This also may be related to the educational emphasis that is the foundation for the funding of the ICN and the myriad training sessions that state employees must attend.

The results for this section of the survey show neither agreement of disagreement as to the viability of the ICN as a communication tool for young women and role models. The first item in this section stated that 'the ICN would be a good tool for information sharing between these two groups'. The average response for the two groups showed they agreed with the statement. However, another item stated that 'young women in need of role models would be interested in using the ICN to gain information'. The IF group's aggregate response was slightly negative and the DHS group's response was weakly positive. Qualitative data in the form of written comments may offer an explanation: some respondents

believed that the ICN tended to make personal interaction sterile and impersonal. The very technology that makes it possible to communicate seamlessly across the state also puts the spotlight on any visual and verbal information exchanges. Thus, the intimate conversations that might occur between a role model and protégé would be hampered by the ICN technology.

Reaffirming a previous statement regarding willingness to be a role model, the IF group again was willing to participate while the DHS group declined. Responses from both groups regarding the need for coercion to bring young women into an ICN session were slightly mixed, with the DHS group indicating that incentives might be in order. Is this founded on experiences with their client base or are the IF group members more optimistic in general? The ICN in its purity may not be the best tool for fostering mentor/protégé relationships. A combination of efforts including ICN sessions, personal meetings, job internships, and occupational workshops may have potential. Future research efforts should target at-risk women desiring career guidance in nontraditional occupations rather than DHS representatives. In addition to women, at-risk youth (male and female) may also be a potential beneficiary of career guidance and support from professionals in a variety of occupations.

The last statement in the instrument delved into the comfort level that these two groups had with the ICN technology. Both groups mean response was weakly positive, but the DHS group was slightly more positive. Is this due to more experience with the technology?

In conclusion, the ICN may be an appropriate communications medium for introductory information sessions and general career selection themes, but the traditional role model/protégé relationship may not be possible given access constraints, privacy issues, and the broad needs of the young women in the state of Iowa. For this reason, we recommend that role model information exchanges for at-risk women be limited to general career and guidance information sessions, leaving the development of more personal relationships up to the participants' discretion.

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A GED Math and Science Test Preparation Option: The Iowa Communications Network

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Determining the feasibility and effectiveness of using distance learning as an alternative method for GED Math and Science Test preparation was the purpose of this study. GED students have previously used software and video successfully to prepare for testing but none have used the interactive technology available on the Iowa Communications Network (ICN). The ICN students were compared with students studying in traditional GED sites where students and teachers shared the same physical space. Experienced instructors worked with both groups. ICN instructors had undergone distance instruction training. ICN sites in rural and suburban areas were chosen and traditional sites were in urban areas. Pretests were given and these were followed by evaluative checkups at designated intervals, and the GED Science and Math Predictor Tests served as a posttest. The Predictor Tests resulted in test readiness recommendations. Students were directed to testing centers. Two of the ICN training students completing math and science preparations were recommended for testing but have not tested. One of the traditional site students successfully passed the Science Test. Other Non-ICN students have returned for additional study. The data in this limited study shows that students can become test ready for the Math and Science GED Tests by participating in GED preparation using the Iowa Communications Network..The leap between test recommendation and test-taking can be made only by the student.

Identify and select 10 participants for GED Science and Math Preparation.

Establishing sites and identifying students were initial steps in the plan to study GED preparation. The recruitment process was a collaboration among High School Youth At-Risk Coordinators, St. Peter's and Workforce Development GED Center instructors, and the ABE/GED Coordinator. Students who needed to take the GED Math and Science tests were asked to participate. Recruitment proved to be difficult due to the mobility of the target population. Identifying students in already existing programs proved easier because they were established in a program and, for some, mandatory attendance was part of an overall initiative.

Method	Data Collection	Effectiveness	Expected Outcome	Unexpected Outcome
1. At -risk coordinators were asked to contribute names for possible students.	Contact interested parties.	Coordinator is only direct link to some students.	Some students would be identified.	NO students were identified by coordinator
2. Letters were sent to any student who had already dropped out of ICN and had not taken Science or Math tests.	Enrollment form for new GED/ICN students	2 ICN students started instruction.	It might be difficult to get 5 ICN students.	None of the letters were "returned to sender" and 1 of the 10 enrolled
3. Collect names from traditional site instructors of students ready for science and/ or math	Names from traditional site instructor	Students were already established in their sites.	There should be no problem identifying studentsat regular sites.	Students at traditional sites were pleased to participate.

Offer 3 classes within 30 minutes of selected participants' homes.

Choosing ICN sites was limited by the host schools interest in participating and the ICN schedule. We were fortunate that the locations were Ames, Johnston, and Adel representing urban, suburban, and rural locations. Students needed transportation for all sites. The existing traditional sites were both urban sites located in downtown and the east side of Des Moines. There was no evidence that transportation was an obstacle to attendance and completion. Convenience was a positive consideration for some.

Method	Data Collection	Effectiveness	Expected Outcome	Unexpected Outcome
1. Offer GED ICN classes to Adel, Ames, Johnston	Attendance sheets Student home addresses	Students could be at a class within 30 minutes of leaving home or work from most parts of the county.	Students wouldn't have to travel to DMACC campus for GED instruction.	One student stopped at an ICN site on his way home from work and said that he would not have attended if the site had been at his former high school.
2. Used city sites accessible by car and bus for traditional student centers.	Attendance sheets Student Home addresses	Students could choose sites but all stayed at the site they were already attending.	Most would continue at their site because of Promise Jobs requirements or transportation arrangements.	NONE

After identifying the students and selecting sites, orientation meetings were held with the instructors to describe the purpose and process for the study. ICN instructors were trained for presentation over the ICN. Traditional instructors would use their normal procedures with one exception: students would have their own textbooks to use during class and at home. Similar ,if not identical, topics would be highlighted during the preparation time. For example, all math students would study decimals, fractions, and percents but the sequence might vary. The project director also met with the students to thank them for their willingness to participate and to provide an explanation of how the GED preparation for Science and Math would proceed. Students indicated that they were pleased to be asked to participate in a special project and they would be willing to have their attendance and test scores monitored.

All participants will complete Science and Math pre and post tests.

Following GED preparation procedures, pretests were administered. Because reading skills are so critical to success on the GED science test, students are given a standardized reading test prior to taking any content pretests. All students (ICN and NONICN) took the Tests of Adult Basic Education (TABE), Level D. Science pretests were in the Science textbook and students were to take these on their own time and report responses to their instructor. All students did not finish their science pretests. When asked, some responded that they knew they needed to study everything in the textbook anyway, so why take the test. Instructors later used the pretest questions as practice and to check student understanding of concepts already presented. For those who did finish, a diagnostic chart in the text indicated the areas of strength and weakness. The TABE math test measures mathematical computation, concepts, and applications and served as the math pretesting tool. All students completed TABE math testing and their results were recorded.

Posttesting occurred near or at the completion of the study. In traditional preparation classrooms there is no set length of instruction before mastery is tested. The ICN students received fifteen hours of instruction in Science and 15 hours of Math. Students who completed the preparation project were given the GED Predictor test as a standard indicator of

test readiness. The Predictor or "half test" had one half the number of questions as the actual GED test and is taken in one half of the time. This test is used commonly in GED preparation programs and the results guide the instructor's recommendation and the student's decision to test. Of the two ICN students remaining at the end of the project, both scored in the range that would have received an instructor's recommendation to "go take the math and science tests". In the Non-ICN group, the only science student tested midway through the project and went on to pass the actual GED Science test. The math students , after 20 hours of study time, had scores that were not high enough to recommend testing. The Predictor test then became a diagnostic tool and additional instruction and practice time were recommended.

Method	Data Collection	Effectiveness	Expected Outcomes	Unexpected Outcomes
1. Make pre and post tests available to instructors and students.	Scores were faxed to the project director and the researcher	Not all students completed the science pretests in their books. Students who finished the study did take the posttests.	Studens and instuctors would have an idea of what students and their eventual test readiness	Studens didn't view the pretests as an indication of what they needed were just tests with no real purpose. It was difficult make changes to the ICN curricula based on testing results.
2. Use **TABE** scores as a backup for any who do not complete the materials.	TABE reading scores are recorded.	The TABE reading scores were useful in identifying skills needed for the science content.	Some students would not complete the pretests in the book.	NONE
3. Suggest use of same Posttest for all ICN students as their instruction has been identical.	All ICN students take Form CC and tests are scored by project director and scores are recorded.	Form CC tested materials similar to those covered by direct instruction in the ICN sessions.	Student posttest scores would be high because the materials tested were similar to the instruction.	Test responses were not the same for materials covered in class, but similarities were in the type of question missed.
4. Traditional site students took a variety of levels as some had already taken CC prior to being part of the study.	Test scores were recorded	Studens had more opportunities for posttests as their GED sites had all 6 forms of the test available	Test results would vary. Students with high reading skills could test out before the study was over.	Posttest scores varied by form One student was able to take the actual GED before the study ended.

Administer three evaluative Science and Math tests at designated intervals.

In GED preparation, informal evaluations usually come from a textbook and students do them as they complete the lessons. Also, because many of the GED students are often text anxious early in the preparation stage, the evaluation may take different forms. For this study, the first evaluation was a paper and pencil test consisting of typical GED questions covering the areas they had studied. The second and third evaluations were interactive with students responding to questions posed by the instructor. Students worked in pairs or groups to answer one question and then were asked to respond individually to other questions. By coming later in the study, students (both ICN and Non-ICN) felt comfortable sharing their answers. By having the students provide answers aloud, the instructor was able to gauge the understanding of the concepts and the thinking process involved in the solutions. The

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interactivity possible with the ICN made these evaluative methods just as effective as in a traditional classroom. ICN instructors also had the bonus of having the sessions on video tape to review . The greatest challenge with the evaluative tests was in finding time in the ICN schedule to do the testing. Changing to the interactive evaluations made this less of a problem as instructors were able to use these almost as a review and present them at the beginning or end of a session.

Method	Data Collection	Effectiveness	Expected Outcomes	Unexpected Outcome
1. Select 3 intervals during instruction for tests and have instructors administer.	Intructors notified of suggested times.	Instructors could agree or change the suggested times.	Three checkups would fit well into the schedules.	ICN time was precious and it was hard to find 45 min. of unused time.
2. Match checkups to instruction	Use instructor syllabus and textbook setup to choose topics.	Tests matched the materials	Tests would provide additional information for instructor and student.	Tests providede additional practice with GED style Students didn't adjust their study habits based on the results.
3. Give tests to all participating students.	Record scores	Provided instructors with some idea of what students could do on their own. Not all students completed all	Students would see value in knowing where they needed more study time. Instructiors could adjust instruction based on the results	Students who missed a session didn't always get the tests. For the ICN, an in class question to be answered on screen by each student provided a better look at the thinking process.

All participants' evaluative science and math results will be reported.

The project director worked with the instructors to record the scores from the evaluative tests. In some instances, the researcher was in the classroom when evaluations were given. Posttests were administered by the designated tester at the NONICN sites and by the project director at the ICN sites. Recommendations regarding testing and /or continued study were given immediately to the students. If students required additional study, instructors were notified. The exception was the ICN class which terminated after the study.

Method	Data collection	Effectiveness	Expected Outcome	Unexpected Outcome
Collect scores from participating sites	Scores from evaluative, pre and post tests are kept by the instructor and given to the researcher.	Scores provide a track of student progress and participation	Scores will indicate who should test and who needs more instruction.	Non-ICN students could take more than one posttest during the study and the difference in scores gave more data for deciding when to take the GED test.

Participants' actual GED science and math test-taking participation rates will be assessed and reported.

As of this writing (September, 97) none of the students completing the study have taken the actual GED Math and Science Tests. At the end of the study, students with passing Predictor test scores were given the address and times for GED Testing Locations.

Method	Data Collection	Effectiveness	Expected Outcome	Unexpected Outcome
1. Students are directed to testing centers.	Official GED scores are printed out by Test Examiner.	Some students would be returning to a test-taking site where they've already tested.	Students whose test results indicate potential success will want to test Students will take tests as soon as possible after instruction is ended.	Students who were moving did not take tests before leaving state. Testing Centers were on restricted hours when students were ready to test Students who were returning to their sites for additional instruction were more apt to test.
2. Talk with students regarding testing decisions.	Use phone, survey, or face to face to discuss testing decisions.	Held discussion with Non-ICN students regarding studying and testing in math and science.	Contacting students would be possible since addresses and phone numbers were on file.	ICN students who indicated that they would test couldn't be reached as letters and phone calls went unanswered.

Due to ABE/GED summer scheduling, testing times have been limited. Attempts to reach the ICN students have been unsuccessful . One of the young men has left the state and another has moved with no forwarding address. Of the students at the traditional sites, three have returned to continue working on math and hope to test in the near future.

Study Evaluation

The chart below documents the changes in the student roster during the study. Class location did not appear to determine leaving or staying. The ICN and its technology were never given as a reason for discontinuing attendance. Also, the reasons given for dropping are common among GED preparation students.

Total Enrolled	Gender	Reason for drops	Number of drops	Number of Tests Taken
ICN	4 Male 2 Female	moving work schedule personal problems	2 male 2 female	O
NON - ICN	1 male 5 female	personal problems work schedule illness	1 male 2 female	1- Science

The data indicates that preparing for testing is possible in both formats and neither the ICN or the traditional classroom guarantees that a student will actually take a test. If both groups had experienced instructors, access to materials, books to take home, what differences might have existed? First, the ICN schedule offered instruction twice weekly for seven and one-half weeks totaling 37 and one half hours of class time. The Non-ICN students could attend as many as three hours daily for five days per week. With 60 hours of

class time available during the four weeks attendance was monitored, attendance ranged from 2 to 13 hours per week. The ICN schedule was firm and if students wanted more class time, they had to seek out another GED Center. Non-ICN students had direct access to an instructor for more time than the ICN students. Also, most of the Non-ICN students chose to study only 1 subject at a time while the ICN students studied both Math and Science at every session. The ICN students reported higher TABE Reading and Math scores than the Non-ICN students. Checkup scores and responses were consistently higher for the ICN students. In interviews, the Non-ICN students talked about the value of doing work at home while the ICN students confessed to doing very little work on their own. Perhaps the strongest statement that can be made from this limited study is that there is evidence that, with some changes , ICN GED Math and Science testing preparation could be an option for some students. That statement should then lead to research into what changes (i.e. support systems) need to be implemented to ICN instruction to ensure that testing is the natural conclusion to test readiness. Access, scheduling, and student's existing skill levels may also be areas for study when considering a GED preparation program using the ICN.

A Study of the Motives and Factors Affecting Participation in Adult Distance Education Classes in an Iowa Community College
A Preliminary Report

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This is a report of the first two phases of a three phase dissertation project. The findings of the third phase (student indepth interviews) of this qualitative study will be reported in a future publication.

Introduction

Education for the adult learner is a leisure activity (Courtney, 1992). That is, it is just one of the activities that some adults pursue in their leisure time, outside of the time they spend working and sleeping, recreating, and attending to personal needs. The learning may satisfy a casual interest, a need, a goal, or may satisfy some other yearning felt by the individual. In this sense, fulfilling an educational interest requires time that is left over after an adult satisfies the other necessary demands on of his/her life.

For many, following high school graduation, that decision is easy. Typical high school graduating classes see about 62% of the class attend college right out of high school, but only 28% complete at least two years of college (U.S. Census Bureau, 1994). The potential market of the community colleges and universities in this country are the 72% of the population who do not have at least a two year college degree. And for many young adults, as the early working years progress, it becomes more difficult to reenter the halls of institutions of higher learning. Age, lack of self confidence, lack of peer support become prominent barriers to adults attending college (Cross, 1981). But for whatever the reason, a growing number of adults do enroll in some form of adult education every year.

Many colleges, both in Iowa and across the United States, have begun offering degrees by way of distance learning technologies, that is, education that is delivered very near to the student's abode, and even right into their home. These efforts attempt to defeat a barrier that exists for many who might be interested in enrolling, but cannot—that of living too far from a college campus.

This study attempts to investigate what factors and circumstances occur in the adult learner prior to making that decision to enroll in a formal course of study offered through distance learning. In short, the study will explore that which attracts, motivates, and compels a distance learning student to enroll.

Participation Research in Adult Education

There has been a great deal of research in the area of participation in adult education. In this study, adult education is defined as the purposeful pursuit of organized learning by an individual beyond compulsory age; this might include instruction in credit or non credit formal courses, vocational training, or professional development to upgrade job skills.

A major contribution to participation research came in 1961, when Cyril Houle concluded that there are three motivational orientations around which most adults participating in adult learning tend to cluster. Termed Houle's Typology, they include a goal orientation, activity orientation, and a learner orientation (1961). Subsequent research by Roger Boshier ten years later and others have tested and expanded on the Houle Typology, resulting in a better understanding of participation motives. Boshier (1971) found 14 first order motivational orientations. Some studies have given support to Houle's Typology; none have really discredited it, except to expand the number of motives, typically to five or eight (Cross, 1981).

Among the early findings in adult education participation research has been that there appears to be a relationship between the amount of one's previous education and one's inclination toward continuing that education (Anderson and Darkenwald, 1979; Bajtelsmit, 1990; Feasley, cited in Stahmer, 1990; Johnstone and Rivera, 1965; National Center for Education Statistics, 1980). As Anderson and Darkenwald (1979) put it"The most power-

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ful predictor of participation in adult education is the amount of [previous] formal schooling" (p.3). It has also been quite apparent that socioeconomic levels have had a strong influence on whether or not one would enroll in an adult education program. (Cross, 1981; Johnstone and Rivera, 1965). The higher the socioeconomic level, the more common it has been for further education in one's life.

More recent work has introduced yet another facet of participation. Patricia Cross (1981) suggests that there is more to enrollment in adult education than simply motivational inclinations of the participants and their backgrounds or demographics of the individuals. Cross attempted to explain the influences of such additional participation factors through a Chain of Response model, to account for such factors as barriers to enrolling, incentives or enablers that encourage participation, and the effects of life stages on the inclination to enroll.

Among barriers to participation, up to 50% of respondents in survey research have reported that cost of education and lack of time are obstacles to education (Cross, 1981). Other barriers that sometimes interfere with enrollment include lack of child care, lack of transportation, (situational barriers), inconvenient locations, lack of relevant courses (institutional barriers), and lack of interest and lack of peer support (dispositional barriers) (Carp, Peterson, and Roelfs, 1974; Rubenson,1986). In the latter set, lack of interest is, perhaps, the most compelling of barriers for the poorly educated, for they do not perceive the need for education in the same light as those in higher socioeconomic strata (Cross, 1981; Johnstone and Rivera, 1965). The poorly educated have "practically no interest in knowledge for its own sake...nor is education seen as an opportunity for the development of self expression, self realization, growth, and the like" (Reissman, 1962. p.12).

Sean Courtney compiled extensive reviews of research dealing with participation in adult education both through his dissertation (1984) and in a more concise book entitled *Why Adults Learn* (1992) . His premise was that participation in education is an extension of the concept of social participation. That is, individuals as members of their society participate or choose not to participate not only in educational activities, but in a wide assortment of events during their lives. Participation in adult education, Courtney contends, is highly dependent on one's general level of participation in social groups and other activities.

The Community College

The traditional community college, by its very name and nature, has played a key role in serving the educational needs of students, especially those looking for career or job training and for those who are beginning a college education. It can even help provide a student who did not graduate from high school with a General Education Diploma (GED) and better reading skills that are necessary to begin a college education.

Most often, community college students are those who live relatively close to a campus, that is, in or near the community where the college is located. In some instances, satellite centers or outlying campuses are established to make it more convenient for students living in other communities further away to participate in college courses. Even day care might be provided for the student with dependents.

Some courses at these centers are taught by college instructors who travel to or live in the outlying community. Many colleges have also attempted to reach out to the outlying student, as well as the working student with courses at night, on the weekend and at distance learning interactive classrooms located at these centers. No matter what circumstances might deter the student from attending college classes, there are ways of overcoming those deterrents that a college might attempt.

In this sense, distance education, in providing primarily traditional courses to students who find it difficult to travel to campus, is a means of reaching students who otherwise might not enroll. But providing quality education in a convenient location does not always result in students enrolling.

Some individuals who enroll as distance learning students may do so for some of the same reasons that other adults enroll in on campus courses: to seek a degree, to complete required training, to advance in their current job, etc. (Hawkeye Community College, 1996).

Although the research that has been conducted in adult education participation can be a starting point for a study of participation of adults in distance education, few studies have explored this specific area.

Distance Education

Distance education is perhaps one of the most dynamic and enriching forms of learning that exists today. With the explosion of recent technological advances in society, distance education is becoming a major educational thrust throughout the United States. Distance Learning is an already extremely popular form of adult education in such countries as Great Britain, Canada, and Australia where Open Universities enroll thousands of new students each year.

Potentially the delivery of learning at a distance encompasses all of the structure of solid, effective college instruction that is normally used by the best instructors. These include lecturing, discussion, testing and grading (McKeachie, 1986), to which I would add demonstration, and multimedia delivery. The added enhancement of technological tools of an up to date distance learning classroom at the fingertips of the instructor, has increased the potential for effective and visually interesting classroom presentations.

These technological tools, with which many distance learning classrooms are equipped, include video recorders/players, three chip video cameras, computers, microphones, video disk and CD ROM players, electronic slide units, satellite receivers, phone lines, internet connections, and almost any other form of media of either an analog or a digital signal that might be needed. Traditional college teaching might from time to time incorporate some of these approaches, but the typical college classroom is not so equipped for spontaneous use.

This scenario describes the new live interactive television classrooms that exist in Iowa (such as those classrooms connected to the Iowa Communications Network—ICN) and those in a number of other states that incorporate fiber optics, microwave, instructional television fixed service (ITFS) and satellite to deliver live interactive classes to distance learning students. There are other scenarios that provide distance learning opportunities to students on a delayed or asynchronous basis, such as telecourses (either broadcast or taped), guided correspondence study, on line or internet courses, audio conferencing, and so on. Many new or reentering college students might find several of these options available to them, at a growing number of colleges and universities.

These alternative delivery systems exist to enable a learner in an off campus location to enroll and participate in college courses without the need to drive to a campus, that might be many miles away. Most distance education programs are efforts to counter the barriers of time and location that could prevent enrollment. Technology will never guarantee success or even a conducive learning environment, but it can provide an opportunity for learning that the student would otherwise not have.

Unfortunately, the realm of distance education has paid little attention to why students enroll in distance courses or the precursors of enrollment. While many studies have explored distance learning from an effectiveness and achievement perspective (Baere, 1989; Cheng, Lehman, and Armstrong, 1991; Clark, 1983; Martin and Rainey, 1993; Soulder, 1993), few studies have explored participation and factors affecting enrollment. Distance educators have been seemingly happy to have students enroll regardless of their motives or goals. But their motives for enrolling and other factors in their decision may have significant impact on their ultimate success.

Distance Education Participation

There have been a few studies that have attempted to investigate some aspect of or relationship to participation of students in distance education programs. For example, Four dissertations have investigated some aspect of participation or reasons for enrollment in distance education courses. (Brown, 1986; MacBrayne, 1993, Rasmussen, 1992; Wilkes, 1989). Barriers to enrollment have been eloquently summarized by Rubenson (1986). But other participation literature comes primarily from the overall realm of Adult Education as highlighted above.

There has been considerable adult education research on characteristics of students (Hopper and Osborne, 1975; Kaplan, 1945; London, Wenkert, and Hagstrom, 1963; Verner

and White, 1965). Barbara Brown's (1986) research emphasis was on the characteristics of telecourse students in South Dakota. The data in her study are based on the Boshier Education Participation Scale and the Attributional Style Questionnaire. Over 80% of the subjects in her study were female, since most were either teachers or nurses. These two professions typically have a higher percentage of women practitioners than men. In addition, 75% of the participants in the Brown study had completed at least one college degree, and were enrolling in the telecourse as a refresher or for graduate study.

Two studies investigated the community college distance student enrolling for the first two years of college. Clyde Rasmussen (1992) explored factors that influenced adult students who participated in distance learning at two Oregon Community Colleges. And Pamela MacBrayne (1993) studied Associate Degree students in rural Maine.

Rasmussen compared students who had enrolled in instructional television (meaning non-interactive televised instruction such as telecourses) and interactive television (meaning live televised instruction with at least two-way audio and one-way video interaction).

Characteristics of students in the Rasmussen study, and to some extent in Pamela MacBrayne's dissertation, showed an interesting profile of the adult distance learner. Of demographic interest, 75% of Rasmussen's sample were women and 68% of the sample were either married (56%), divorced, separated or widowed (Rasmussen, 1992). The greater involvement of women distance learners over men was similar in the MacBrayne study (78%) at the University of Maine in their Associate Degree program (MacBrayne, 1993). In addition, most (more than 50%) of the participants in both of these two studies were over 23 years of age, and worked part time or full time (MacBrayne, 1993; Rasmussen, 1992). It's important to note that both the Rasmussen study and the MacBrayne study included in their samples all students who were enrolled in their respective institutions in a distance learning two year degree program, not selected students who might be enrolled in a program where one gender tends to predominate as in Brown's study.

Rasmussen reported that students felt that instructional television courses were more convenient than interactive courses, and he found that the two strongest influences on enrolling were convenience and the instructor (Rasmussen, 1992).

MacBrayne concentrated on what motivates rural adults to enroll in associate degree distance education programs. This appears to be the only qualitative study that has been done with community college distance education enrollment motives until now. MacBrayne utilized both quantitative and qualitative methodologies, with interviews being conducted with 30 students to provide a more comprehensive understanding of their underlying motives to enroll.

Students were enrolled in courses taught over a live interactive television system of one form or another. In the study, Four distinct factors emerged as characteristic motivational traits. They included: "degree seeking, information seeking, participating, and job enhancing" (MacBrayne, p. 114). This study was the only one to also explore barriers and facilitators to enrollment. Of prime importance to most of the subjects was that the course was offered in a nearby location. The most common barriers mentioned were lack of time and lack of money, (MacBrayne, 1993).

In a study that dealt with student satisfaction and enrollment motives, Charles Wilkes (1989) found that there was little relationship between overall student satisfaction in an electronic distance education environment and students' motivational orientations. His study dealt exclusively with students who participated in an "electronic" environment. In other words, it involved live classes where students could communicate with the instructor through audio and video exchanges as well as through graphic and facsimili capabilities.

Summary

Although the aforementioned studies shed important light on the motives and characteristics of distance learning enrollees, there remains compelling questions about the factors that cause or inhibit community college students from enrolling in distance education programs.

Are there influences in a student's past experiences or psychological makeup that motivate adults to enroll? Do these students have peers or outside pressures that move them or persuade them to enroll? Do these distant students enroll for the same reasons as on campus

students, or for different reasons? Does the technology itself, that is used to provide education at a distance, play a role in their participation, either encouraging or discouraging? And if these distance students are demographically different from on campus students, it would follow that they could very well have different motives for enrolling in a course, and be affected by different factors in their decision to enroll.

Research Questions

1. What motives for participation are present among community college students who enroll in distance education courses?
2. What barriers are perceived to exist for students who enroll in distance education courses?
3. What enablers or encouragement factors are perceived to exist by distance education students?
4. Are motives, perceived barriers and enablers the same for students who participate in various kinds of distance education formats, i. e. interactive television, telecourses, computer instruction, audio conferencing, etc.?
5. Is age or gender a factor in participation in distance education?

Methodology

Phase 1: Focus Group Listserve and discussion

A focus group of distance learning and adult education experts were asked to form an electronic focus group. The role of the focus group was to formulate the key issues and questions that would be explored in the questionnaire and during the interviews with the distance education students.

Members of the electronic focus group included the following:

David Bunting—Kirkwood Community College (Iowa)
Dr. Sean Courtney—University of Nebraska at Lincoln
Dr. Jacques DuBois—Brevard Community College (Florida)
Dr. Ellen Kabat—Eastern Iowa Community College District
Dr. Pamela MacBrayne—University of Maine
Wayne Prophet—University of Iowa
Ms. Sylvia Scinta—Public Broadcasting Service

Focus group participation was voluntary. The discussion of the focus group was conducted by email and through an electronic bulletin board that was set up with the cooperation of the University of Northern Iowa, and called DLMOTIVES.

Focus Group Questions

Background information about the study, the purpose of the focus group, and instructions about the procedures that were followed were explained to all members of the focus group in a DLMOTIVES FAQ (Frequently Asked Questions). The members of the focus group were asked to consider a question and respond with their thoughts, feelings, experiences and suggestions. Then, to also react to the responses given by the various members of the group. In this way, a discussion was generated, resulting in a rich environment of thought and idea formulation. The focus group discussion commenced with an initial question from this researcher. And subsequent questions were then posed to the group after everyone had had a chance to comment and react to the others' comments.

The questions discussed by the on line focus group included the following:

1. To begin the discussion let us consider the positive factors and incentives that often bring students to enroll in college classes, especially distance education. What are some of these factors? What motivations have been prominant? What do colleges do to draw students to enroll?

2. At the community college/associate degree level, what potential deterrents would these students face in considering their enrolling in a course of study? Consider situational, institutional, and dispositional barriers. Do you agree with Cross and Rubenson, who seem to feel that dispositional barriers have been the least studied deterrants for adult ed and distance learners?

3. In view of recent advances in communications technologies (such as the prevalence of computers, fiber optics, cell phones, etc.), what positive influences, and what negative influences might these technologies pose for students enrolling in distance education classes? Would certain students prefer a particular mode (telecourses, interactive television, on line courses, etc.) of distance learning over others and why?

Phase 2: Student Questionnaires

The purpose of the student questionnaire was twofold: 1) to provide initial data concerning demographics, some initial background information about the distance learning students, and to begin to explore their motives and factors of participation/enrollment; and 2) to provide a screening instrument for the selection of approximately 20-25 successful distance learning students who would be willing to be interviewed for the third phase of this study.

With the cooperation of Kirkwood Community College in Cedar Rapids, Iowa, its director of institutional research and enrollment, and its director of distance learning, a computer list was generated of all Kirwood students that had enrolled in one or more distance learning courses durng the fall semester, 1996 through fall, 1997. The list included approximately 7000 names on a 400 page computer printout. It included each student's address, age, gender, term(s) enrolled from Fall, 96 to Fall, 97 with courses that had been taken and their respective grades.

Kirwood Community College was selected as a research site because of the maturity of its distance learning program (more than 15 years), the variety of population densities served (from 350,00 population to towns of only 200 people), and the variety of distance learning formats (live interactive television, telecoureses, and internet courses).

A total of 210 names were selected and compiled into a separate spread sheet file based on the following criteria: a) Student had accumulated at least 6 semester hours of course work; b) Student was enrolled in a distance class during the current semester (Fall, 97); and c) Student had been successful in completing most of their distance courses (F's and W's would not indicate success); Approximately one student on every other page of the computer printout was selected to receive a questionnaire.

A two page questionnaire was developed that included an introductory statement about myself and the purpose of the research. Questions on the survey included name, address, phone, miles to nearest Kirkwood site, which format of distance course they had taken, whether they had access to a computer at home, career field, and a series of 14 statements they were to rate using a five point Lickert scale about their incentives and decision to enroll. These last questions were adapted from the literature, especially the MacBrayne study. Two additional questions were added by the Kirkwood director of distance learning about what the student liked about the course(s) and what might improve the courses they took. A self addressed stamped envelope was also included in the mailing. The director of IRE also composed a cover letter to accompany the questionnaire that encouraged the student to complete the survey, and that by doing so in no way would affect their grades or courses at the college. Confidentiality was also assured to the student. The students were asked to return the questionnaire within a 10 day time frame. A follow up letter and another copy of the survey was sent approximately two weeks after the first to the students who had not yet returned their survey.

Findings

Focus Group

All of the seven members of the focus group contributed to the on line discussion about distance learners and their motives of participation. These individuals represented a diversity of backgrounds and experiences from community colleges, universities, and the Public Broadcasting Service and from both an administrative and faculty perspectives. Three of

these individuals resided in Iowa, the others in Nebraska, Florida, Maine, and the Washington, D. C. area.

Among the significant comments that were contributed during the discussions included the point that convenience is indeed a factor for many prospective college students. Juggling home, family, work, and school, off campus courses and minimal driving time is the only way that these students could attempt to attain a degree. The concept of Time Dependent/Independent and Place Dependent/Independent become factors for some students that ultimately determine whether or not they enroll. However, a certain degree of self discipline is essential for the success of the distance learner. And this factor becomes more important to their ultimate success as time and place of the course become more independent. Less self discipline is needed when the course is more time and place dependent.

Incentives and enables for prospective college students are also important factors that contribute to their decision to enroll. Marketing is often most effective when it is by word of mouth, but external factors such as peer and spouse support, flexibility from their employer to attend classes, child care provisions, even toll free phone numbers sometimes make a difference in the student deciding to and actually enrolling in the class.

Barriers to participation in distance learning are perhaps even more significant than for on campus students because the time factor and often the transportation factor are addressed to some extent when the course is offered in a convenient, nearby location. However dispositional barriers still persist. Lack of money, poor academic preparation, low self esteem, lack of spouse support appear to continue to discourage potential learners.

The technology itself that is used in many distance learning classrooms can be intimidating to some students. And taking a telecourse at home does require that the student correctly uses the VCR. But with the advances in technology and its increasing use in the daily lives of many Americans, the aura of technology is rapidly disappearing, or at least should. At greatest risk are the many adults from ages 30-60 who were past their formative years when the technological revolution began. Of less concern are the high school students of today who treat a computer as if it were just another book, or video tape, or toy. They are not afraid of it.

Student Questionnaires—Demographic Information

The average age of the initial 210 distance learning student sample who were sent questionnaires was 28.8 years. The average age of the students who returned questionnaires was 31.4. The average age of students agreeing to be interviewed was 33.3. (younger students tended to return the surveys less and agree to be interviewed less.

The results of the questionnaire showed that:

• 80% of the students worked at least part time and 32% worked 40 hr. or more per week.

• 57% had computer access in their home.

• Average distance to a college site for a distance course was 11.5 miles, and for some it was less than one mile.

• 89% had enrolled in a live interactive TV (ITV) course, 78% had enrolled in a telecourse or Guided Self Study (GSS), 5% had enrolled in an internet course, 68% had enrolled in two or more types (formats) of distance learning courses, 24% had only enrolled in live ITV courses, and 8% had only enrolled in GSS courses.

• Of the four students who enrolled in an internet course, all but one had also taken both ITV and GSS courses.

• Those respondents who returned questionnaires resided in 29 different communities, and represented an interest in 46 different career fields or majors.

These career fields clustered among the following:

Accounting	7	Human Services	8
Business	11	Management	3
Computer related	8	Nursing	6
Criminal Justice	7	Office Admin	4
Education	9	Psychology	4
Fire Science	2	Other	18
		Total	**87**

Student Questionnaires—Motive Statements

- Strongest agreement with motive statements were with statements 1, 3, 7, 11, and 13
  1. these courses are required in my degree program (Degree seeking) M=4.48
  3. These courses are important to my future (Information seeking) M=4.33
  7. These courses were offered in location/time convenient to me (Outside factor) M= 4.39
  11. I wanted to start earning a college degree (Degree seeking) M= 4.52
  13. These courses will help me to acquire skills/knowledge needed for a job (Information seeking) M=4.32

- Least agreement overall were with statements 5, 6, and 12.
  5. My employer wanted me to take these courses (Job enhancing) M=1.35
  6. A friend for spouse encouraged me to take these courses (Outside factor) M=2.12
  12. I took these courses because I wanted to meet people (Participating) M=1.95

Table 1: Mean and standard deviation of each of the statements.

	Statement	Mean	Std Dev
1.	Most of these courses are required in my degree program.	4.48	0.92
2.	The course content is of interest to me.	3.90	0.88
3.	These courses are important to my future.	4.33	0.93
4.	I thought taking college courses would be fun.	2.67	1.11
5.	My employer wanted me to take these courses.	1.35	0.90
6.	A friend or spouse encouraged me to take these courses.	2.12	1.47
7.	These courses were offered in a location/time convenient to me.	4.39	0.90
8.	The courses will improve my chances of promotion in my work.	2.95	1.55
9.	I wanted to take college courses rather than learn on my own	3.52	1.38
10.	I wanted to prove to myself that I can successfully complete a college level course	3.64	1.46
11.	I wanted to start earning a college degree.	4.52	0.95
12.	I took the courses because I wanted to meet people.	1.95	1.05
13.	These courses will help me to acquire some of the skills/knowledge I need for a job.	4.32	1.10
14.	Other (please describe)		

Discussion

The results of the student surveys seem to indicate that two primary forces are at work among the majority of the students who participated in the distance learning questionnaire. They are predominately degree seeking students and information seeking students. And the fact that the distance courses are offered at a time and place that is convenient to them appears to be a key factor in their decision to enroll. The goal orientation of some of the students is apparent in their looking toward applying the information gained from the courses to their future careers.

The diversity of careers represented among the distance learning students seems to indicate that there is an interest in the course offerings that transcends individual disciplines or career fields. It is probable that some of these students are pursuing a General Education Associate in Arts degree almost exclusively through distance education courses, while others are completing requirements and electives in a more convenient manner than attending on campus.

Another interesting fact is that 88% of these students had enrolled in at least one live interactive television course, while 78% had enrolled in at least one telecourse or Guided Self Study course. But 68% of the survey respondents had taken a combination of distance courses, i.e., ITV, GSS, and/or internet courses. Almost a quarter (24%) of the sample had only taken their distance courses via live ITV, while 8% had only taken distance courses via GSS. Of the four who enrolled in internet courses, all but one had previously taken both ITV and GSS courses, while the fourth had taken GSS only. They were veteran distance

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learners. This may change as the years progress, and as colleges begin to attract a percentage of students who will prefer to take all of their distance learning courses via the internet.

Perhaps one of the most compelling characteristics of distance learning programs across the country is the gender distribution that appears to be very consistent from state to state. A significantly higher percentage of distance learners are female. Of the entire sample who were sent surveys, 74% were female. In the MacBrayne and Rasmussen's studies, 78% and 75% respectively were female. Of the Kirkwood students under age 25, 62% were female compared to an on campus representation of just over 50%. What draws more women to distance learning classrooms than men? That is a question for further research and possible investigation during the third phase (student interviews) of this study. However, the plurality (80%) of those distance learning students who work, with almost one third working full time or more, would indicate that their lives are already full, and the classes they take are truly squeezed into their limited extra time.

In conclusion, the factors that influence adults to enroll in this community college distance learning program appear to be strongly influenced by the student's desire to seek a degree, and prepare themselves for a future career, even when they are in their 40's or 50's. Although many factors, both positively and negatively, affect their decision, this predominantly female population are strongly attracted to the convenience of taking courses near to their homes and at times that are flexible or allow minimal intrusion into the demands of their lives.

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The Utility of Interactive Study Guides as a Means to Enhance Content Interaction and Student Satisfaction in an Interactive Television Course Utilizing the Iowa Communications Network

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Introduction

An essential attribute of the distance educator is the ability to make his/her students active participants in their educational program. Moore & Kearsley state "it is not too difficult to present information over a distance, but getting people to participate and making learning active at a distance is much harder" (1996, p. 133).

For Florini (1989), a distance educator's effectiveness is "rooted in how instructors use the technology, not in the technology itself" (p. 50). "An intervening technology frequently requires the adjustment of an instructor's teaching style and the implementation of ways to compensate for lack of physical presence" (Oliver, 1994, p. 189). The role of instructor must change "in particular, the balance between presenting content information and organizing the students' interaction with that information" (Moore & Kearsley, 1996, p. 132). Thus, distance educators must focus on student participation and involvement in the distance education classroom to advance learning.

Cyrs and Smith (1990) recommend employing structured note taking or interactive study guides to increase the level of student involvement and participation with the subject matter in the teleclassroom. They define an interactive study guide as,

> a highly organized set of student notes, graphics, pictures, graphs, charts, and activities which are used in conjunction with a telecourse. Key notes, phrases or other visual materials are printed in logical, numbered segments called displays. Not all information is provided for the student...Involvement is forced by leaving out some important terms, and by providing blank lines so that the students can fill in these key concepts within the displays as the telelecture progresses. Also, a note space is provided to record extra information judged by the students to be interesting or important. (p. 96)

Cyrs & Smith list numerous advantages to using interactive study guides (1991, 1990). Simonson, Schlosser and Anderson (1993), in their review of distance education literature, advocate the use of interactive study guides to increase instructor effectiveness.

While the use of interactive study guides may seem an intuitively logical means of increasing student interaction with the content of a course, there is a lack of empirical evidence to support the use of interactive study guides for such purpose. For example, the researcher was unable to identify studies that compared learner-content interaction and satisfaction of students enrolled in telecourses which employ interactive study guides to telecourses which employ content complete study guides. It was for this reason that this study was undertaken.

Study Description

The purpose of this study is to determine if there is a difference in the learner-content interaction and satisfaction of graduate education students when provided an interactive study guide as compared to when provided a content complete study guide in an interactive telecourse. The following research questions guided the study:

1. Is there a difference in the students' level of learner-content interaction when provided an interactive study guide and a content complete study guide?
2. Is there a difference in the students' overall level of course involvement when provided an interactive study guide and a content complete study guide?

3. Is there a difference in the students' level of satisfaction with the coverage of the course content when provided an interactive study guide and a content complete study guide?
4. Is there a difference in the students' overall level of satisfaction when provided an interactive study guide and a content complete study guide?
5. Is there a difference in the students' satisfaction with the instructor when provided an interactive study guide and a content complete study guide?

For the purpose of this study, learner-content interaction is defined as "the process of intellectually interacting with content that results in changes in the learner's understanding, the learner's perspective, or the cognitive structures of the learner's mind" (Moore, 1989, p.2).

Sample

The sample for this study was forty-one students enrolled in a three credit hour graduate education class offered at eight locations utilizing the Iowa Communications Network (ICN). The ICN is a fiber-optic telecommunications system that provides full-motion video and audio transmission. The students were enrolled in the graduate class The Adult Learner offered as part of the Drake University Master of Science degree program in Training and Development.

Instruments

Twenty-two of the students enrolled in four of the eight ICN classrooms received an author-constructed study guide containing most all of the content information provided during the first half of an eight hour class module (Period A). The remaining nineteen students received an author-constructed interactive study guide that did not include all of the content information and required the students to fill in information provided during the first half of the module. At the mid-point of the eight hour module, the first student group received an interactive study guide which covered the second half of the eight hour module (Period B) and the second group received a content complete study guide.

An author-constructed assessment was administered at the mid-point and end of the eight hour module to measure the students' self-reported level of learner-content interaction and satisfaction with both forms of study guides. The assessments consisted of a series of similarly worded questions designed to measure the students' level of learner-content interaction and satisfaction with the interactive study guide and the content complete study guide. For example, the students were asked on the assessment for the interactive study guide, "To what extent did the interactive study guide assist you to be involved with the coverage of the course content?" Whereas, the students were asked on the assessment for the content complete study guide, "To what extent did the content complete study guide assist you to be involved with the coverage of the course content?"

The questions were scored on a 7-point Likert scale with "1" representing a minimal level and "7" representing a high level of interaction or satisfaction with the item in question. The students also provided written comments pertaining to both forms of study guides. A class member at each site distributed the study guides and administered the assessments at the midpoint and end of the eight hour class session.

The content validity of the survey items was assured following a review of pertinent literature. A high degree of internal consistency reliability was found for the content complete study guide (Cronbach's alpha=.90016) and for the interactive study guide (Cronbach's alpha=.93377). In addition, all item-omitted correlations exceeded .7 except for question four on the content complete assessment which was .6553. This indicated that there was a high degree of internal consistency for both assessments.

Methodology

A two-period crossover design was utilized to compare the two study guides in an ICN classroom. The data consisted of the students' responses to the five questions measuring their degree of interaction and satisfaction with the study guides.

The data were analyzed by a repeated measures ANOVA with sequence as a between-subjects factor and treatment (study guide) as a within-subjects factor. The main effect F-test was used to test for differences in the two study guides on the questions.[1]

The paired t-test was used to test for treatment differences within sequences. The separate variances independent samples t-test was used to test for treatment differences within periods (across sequences). This provided the following for each of the five questions on the instruments:

* an overall test of the hypothesis of no treatment differences
* a test of the hypothesis of no treatment differences for each sequence, using the same subjects (at different periods, with different lecture/study material).
* a test of the hypothesis of no treatment differences for each period, using the same lecture/study material (but with different subjects).

A table delineating the statistical data is provided for each research question. Numbers in body of the table (in parentheses) are means for a sequence and period combination; decimal numbers in the margins of the table are P-values for testing the difference of preceding means (to the left or above); the decimal number in the lower right cell of the table is the P-value for the treatment effect in the crossover design ANOVA using all of the data for a given question. Shading indicates statistical significance (P<.05).

Findings

1. Is there a difference in the students' level of learner-content interaction when provided an interactive study guide and a content complete study guide?

The first test sought to determine if there was an overall difference in the treatment (interactive versus content complete study guides). The F-test of no treatment differences based on the repeated measures ANOVA was marginally significant (P=.0893).

No significant difference was found in the first sequence in which the 22 students began with an interactive study guide (Period A) followed by a content complete study guide (Period B). A significant difference was found in the second sequence in which the 19 students began with a content complete study guide in Period A followed by an interactive study guide in Period B (P=.0305). Upon investigation, the content complete study guide received higher scores than the interactive study guide.

In the morning session (Period A) no significant difference was found when the 22 students with the interactive study guide were compared to the 19 students with the content complete study guide. A significant difference was found for the afternoon session (Period B) when the 22 students with the content complete study guide were compared to the 19 students with the interactive study guide (P=.0263). The content complete study guide received higher scores than the interactive study guide.

This means that significant differences were found in the extent to which the type of study guide assisted the students to be involved with the coverage of the course content. This occurred in the second sequence (same students - different course content - different study guides) and during the afternoon period (different students - same course content - different study guides). When significant differences were found the higher scores occurred when the students were provided the content complete study guide.

Table 1. Learner-Content Interaction, Interactive versus Content Complete Study Guide.

Sequence	Sample size (N)	Period A	Period B	P-value
1	22	I (5.136)	C (5.227)	.8421
2	19	C (5.316)	I (4.316)	.0305*
P-value		.6996	.0263*	.0893

*p<.05

2. Is there a difference in the students' overall level of course involvement when provided an interactive study guide and a content complete study guide?

The F-test of no treatment differences based on the repeated measures ANOVA was not significant (P=.1096). A significant difference was observed in the afternoon session (Period B) when the 22 students with the content complete study guide were compared to the

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19 students with the interactive study guide (P=.0089), using the same course content. Upon investigation, the content complete study guide received higher scores than the interactive study guide.

Table 2. Overall Course Involvement, Interactive versus Content Complete Study Guide.

Sequence	Sample size (N)	Period A	Period B	P-value
1	22	I (4.636)	C (5.136)	.2415
2	19	C (4.684)	I (4.053)	.2810
P-value		.9296	.0089*	.1096

*p<.05

3. Is there a difference in the students' level of satisfaction with the coverage of the course content when provided an interactive study guide and a content complete study guide?

The F-test of no treatment differences based on the repeated measures ANOVA was significant (P=.0001). Overall, there was a higher level of student satisfaction with coverage of course content when provided the content complete study guide. In addition, there was a significant treatment difference across periods in the second sequence (P=.0011), where 19 students were given different study guides to use in sessions with different course content. Finally, there were significant treatment differences across groups in the morning (P=.0358) and afternoon (P=.0003) periods where different groups of students were given different study guides to use with the same course content. A marginally significant difference (P=.0535) was found for the first sequence. In all comparisons, the content complete study guide received higher scores.

Table 3. Satisfaction with Coverage of Course Content, Interactive versus Content Complete Study Guide.

Sequence	Sample size (N)	Period A	Period B	P-value
1	22	I (4.727)	C (5.455)	.0535
2	19	C (5.579)	I (3.684)	.0011*
P-value		.0358*	.0003*	.0001*

*p<.05

4. Is there a difference in the students' overall level of satisfaction when provided an interactive study guide and a content complete study guide?

The F-test of no treatment differences based on the repeated measures ANOVA was statistically significant (P=.0005). The students reported a higher level of overall satisfaction when provided the content complete study guide. In addition, there were significant treatment differences across periods in the first (P=.0314) and second (P=.0056) sequences, where the same students were given different study guides to use in sessions with different course content. Finally, there were significant treatment differences across groups in the morning (P=.0079) and afternoon (P=.0100) periods, where different groups of students were given different study guides to use with the same course content. In all comparisons, the content complete study guide received higher scores.

Table 4. Satisfaction with the Overall Class, Interactive versus Content Complete Study Guide.

Sequence	Sample size (N)	Period A	Period B	P-value
1	22	I (4.455)	C (5.227)	.0314*
2	19/18	C (5.579)	I (3.889)	.0056*
P-value		.0079*	.0100*	.0005*

*p<.05

5. Is there a difference in the students' satisfaction with the instructor when provided an interactive study guide and a content complete study guide?

The F-test of no treatment differences based on the repeated measures ANOVA was statistically significant (P=.0009). Overall, the students reported a higher level of satisfaction with the instructor when provided the content complete study guide. In addition, there was a significant treatment difference across periods in the second sequence (P=.0015), where 19 students[2] were given different study guides to use in sessions with different course content. Finally, there was a significant treatment difference across groups in the morning period (P=.0114), where different groups of students were given different study guides to use with the same course content. In all comparisons, the content complete study guide received higher scores.

Table 5: Satisfaction with the Instructor, Interactive versus Content Complete Study Guide.

Sequence	Sample size (N)	Period A	Period B	P-value
1	22	I (4.591)	C (5.182)	.1310
2	19/18	C (5.684)	I (4.278)	.0015*
P-value		.0114*	.0646	.0009*

*p<.05

Summary and Discussion

The importance of interaction within traditional and distance education is considered essential. Keegan (1990) views interaction as a key to effective learning and information exchange, and Moore (1989) views interaction as "vitally important" (p. 6) in the design of distance education. "Whether conducting a two-hour videoconference or teaching a complete university course at a distance, utilizing interactive television requires a special set of skills and an understanding of how technology filters the instruction and influences interaction among participants" (Oliver, 1994, p.183).

Interactive study guides have been advanced as a means to increase learner-content interaction (Cyrs & Smith, 1991, 1990) and teacher effectiveness (Simonson, Schlosser and Anderson, 1993) within distance education programs. Little is known, however, about the utility of interactive study guides from a research perspective.

This study sought to determine the utility of interactive study guides as compared to content complete study guides to promote learner-content interaction and satisfaction among students enrolled in a graduate education telecourse utilizing the Iowa Communications Network. The information gained from this study will help educators define the set of skills needed to influence interaction and satisfaction among distance education students.

There was a general preference for content complete study guides over interactive study guides by the students in this study. An overall significant difference was found favoring content complete study guides as a means to promote satisfaction with the coverage of the course content and the instructor. No overall significant difference was found between the content complete and interactive study guide as a means to promote learner-content interaction. However, of those who listed a preference (33) for either the content complete or interactive study guide, 63.6% indicated a preference for the content complete study guide.

The students' written comments supported the quantitative findings of the study. The students indicated that they found themselves too focused on the missing information when provided the interactive study guide and not the overall understanding of the course material. They also indicated that the pacing of the lectures, at times, hindered their ability to print the missing information listed on the interactive study guide. In addition, they stated that they could underline or highlight material emphasized during the class session when they were provided the content complete study guide. This, they felt, served the same purpose as the interactive study guide but without the need to fill in the blanks.

Thus, the findings of this study calls to question the advocacy for forced learner-content interaction or the employment of interactive study guides over content complete study guides as a means to promote interaction and satisfaction of distance education students.

Limitations and Recommendations

Several limitations of this study are noted:

1. This study employed a quasi-experimental design with two treatments applied in a restrictively randomized manner to two naturally assembled groups—students in ICN classrooms enrolled in a graduate education class.
2. The interactive (as well as content complete) study guides in the morning and afternoon periods covered different material. However, in this study the course material was considered to be sufficiently homogeneous to assume that the individual treatments applied in the two periods were essentially equivalent.
3. The design of the interactive study guides is to some extent an art. Perhaps too much information was missing and/or structured in a confusing manner. This could have contributed to the negative findings concerning interactive study guides.

Thus, it is suggested that additional studies be undertaken to investigate the utility of interactive and content complete study guides as a means to promote learner-content interaction and student satisfaction in distance education courses. Moreover, it is recommended that similar studies be undertaken in other fields and with students at different age levels.

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[1] Preliminary tests on sequence and sequence by treatment effects were conducted. If either were statistically significant, a least significant difference (LSD) test was conducted by comparing the treatment means in the first period (morning) only (Milliken & Johnson, 1992). This testing procedure would minimize contamination due to carry-over effects. Neither of these sequence effects were statistically significant in any of the questions.

[2] One student did not respond to the questionnaire in the afternoon period.

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Studio Ceramics over the ICN

Introduction

Brouch (1994) describes the visual arts, music, drama, dance and creative writing as being "intimately involved with the future of instructional technologies" (p. 43). "Classrooms equipped with interactive telecommunications networking capabilities provide opportunities for learners of any age to locate other persons and resources in almost any area of inquiry" (p. 45). She specifically notes a project in New Mexico where music teachers in one part of the state listen to, critique and advise students in another part of the state via satellite connection. Similar projects at Iowa State University (Simonson, 1997a &1997b) have successfully brought vocal and instrumental music instruction to Iowa high school students using the Iowa Communications Network (ICN). The overwhelmingly positive response that met Simonson's music instruction prompted the question that directed this study. Could the ICN be successfully employed for studio art instruction? The intention of the project was to identify a group of Iowa high school art educators who would be willing to participate in ceramics workshops that would be delivered over the ICN, and to evaluate the workshop's effectiveness based on the participants' responses and impressions.

Methodology

An initial survey was sent to 200 Iowa high school art teachers to learn whether or not teachers would be willing to participate in ICN workshops and what topics would be of interest to them. From these survey a pilot workshop was proposed to those who indicated interest. In September, 1997 a workshop titled *Neriage: Patterned Clay* was conducted over the ICN. Participants were interviewed and sent surveys evaluating the success of the workshop. Based on participants comments, the response was found to be positive overall, but final data analysis remains to be completed.

Instrument

The initial survey consisted of three sections. The first section requested demographic information such as age, sex, number of years teaching, level of education, and school setting. It also requested information about whether or not the school was connected to the ICN as well as the respondent's previous experience either taking or teaching a class over the ICN. Finally, this section requested information about inclusion of ceramics in the art curriculum, the level of student ability and available studio equipment.

The second section of the survey addressed potential activities and topics that could be conducted using the ICN. Respondents were asked to rate each activity and topic on a scale of one to three with 1= uninterested and 3 = extremely interested. The activities and topics are as follows:

Activities

1. On-campus ceramic workshop held at Iowa State University with ICN follow-up
2. Ceramic workshop for teachers delivered via ICN
3. Ceramic workshop for students delivered via ICN
4. Professional artist critique/lecture delivered via ICN
5. Other (please specify)

Topics

1. Handbuilding techniques
2. Throwing
3. Glazing techniques
4. Raku firing
5. Integration of ceramics with other disciplines
6. Other (please specify)

The last section of the survey asked questions about the teacher's perceived level of innovativeness. Respondents were asked to indicate their level of agreement with statements like "I am an inventive kind of person" or "I am generally cautious about accepting new ideas." Items in this section were rated on a six point Likert-type scale with 1 = Strongly Disagree and 6 = Strongly Agree. The survey was sent the last week of April, and recipients were instructed to return the survey by May 9, 1997.

Results

Of the 200 survey sent, 61 survey were returned, providing a 31% response rate. It is assumed that the low response rate was due to the fact that the survey was sent near the end of the school year, thus a second mailing was not sent.

Table 1 summarizes the results of the first two sections of the survey.

Table 1. Survey Results

Average # of yrs. teaching		18.37
Average Age		42.6
Gender	m	36.1%
	f	63.9
School connected to ICN	y	65.6%
	n	34.4
Taken a class via ICN	y	23.0%
	n	77.0
Taught a class via ICN	y	3.3%
	n	96.7
School description	public, rural	62.3%
	public, suburban	23.0
	public, urban	11.5
	private, rural	3.3
	private, suburban	0.0
	private, urban	0.0
Level of education	BS/BA	19.7%
	BS/BA +15	49.2
	MS/MA	16.4
	MS/MA +15	13.1
	MFA	1.6
	Ph.D./Ed.D.	0.0
Ceramics in curriculum	y	95.1%
	n	4.9
Description of students	beginning	42.6%
	advanced	1.6
	both	50.8
Skills taught	wheel throwing only	0.0%
	handbuilding only	4.9
	both	90.2
Equipment used	electric kiln	90.2%
	gas kiln	3.3
	raku kiln	1.6
Activities		
On-campus workshop at ISU		
	uninterested	18.0%
	somewhat interested	42.6
	extremely interested	39.3
Teacher workshop via ICN		
	uninterested	9.8%
	somewhat interested	49.2
	extremely interested	39.3

Table 1. *(continued)*

Student workshop via ICN	
uninterested	9.8%
somewhat interested	36.1
extremely interested	47.5
Professional artist critique via ICN	
uninterested	14.8%
somewhat interested	41.0
extremely interested	37.7
Topics	
Handbuilding techniques	
uninterested	1.6%
somewhat interested	29.5
extremely interested	67.2
Throwing techniques	
uninterested	3.3%
somewhat interested	29.5
extremely interested	63.9
Glazing techniques	
uninterested	4.9%
somewhat interested	23.0
extremely interested	67.2
Raku firing	
uninterested	8.2%
somewhat interested	31.1
extremely interested	59.0
Integrating ceramics with other subjects	
uninterested	8.2%
somewhat interested	23.0
extremely interested	65.6

Of the 61 surveys returned, 48 indicated interest in participating some sort of ICN workshop. Several respondents wrote the following comments:

""This is a fantastic idea. For certain curricular areas, (ceramics/metalsmithing especially) access to university has been difficult because classes are filled by previously enrolled students or the course drags throughout the entire summer. We need something 'quick and dirty' due to family. [and] assorted obligations."
"Sounds interesting and informative."
"Great idea. Sign me up."
"Agreat idea using the ICN this way."
"Yes. Please send me more information. I have a high interest in ceramics and would strongly be interested in a summer program!"
"I'd love to participate in these programs. It would be good for the students and myself."
Thanks for your interest, we have just installed our ICN room, had an inservice, but have found that my students dislike videos and much prefer hands-on education! We're seriously considering "block" scheduling year after next."

Initial survey results and comments seemed to indicate that an interest existed among teachers in Iowa to participate in ceramics related ICN workshops. It was decided that a small pilot study would be conducted in the fall of 1997 to test the feasibility of using the ICN for studio art instruction.

Pilot Project

Based on survey results, topics suitable for a short, half-day handbuilding workshop were discussed with Iowa State ceramics professor, Ingrid Lilligren. It was decided that participants would be instructed in the building of *neriage* –a Japanese process for creating patterned clay. Neriage was chosen because it is simple, straightforward, and relatively

clean to demonstrate. Participants would be asked to provide their own materials, and each would construct a block of neriage clay during the workshop for their own later use.

Based on the locations of the 48 survey respondents that indicated an interest in participating in this project, 4 distant sites were chosen: Cherokee, Mason City, Cedar Rapids and Indianola. The intent was to choose locations central to those interested so that no one would have to drive more than an hour.

On August 1, a second mailing was sent, inviting potential participants to the pilot workshop. Responses were requested by August 29. Soon after the mailing was sent, an email arrived from the art teacher at Indianola. He was concerned about the choice of the Indianola site because it was a board room in the school administration building, and in his words "very unsuitable for clay work, no matter how careful one was." Appreciating the advice, the site was changed from Indianola to Norwalk High School.

Fifteen participants signed up for the workshop. A number of others indicated interest but were not able to participate due to prior commitments. Two weeks before the workshop, participants were mailed a list of materials they would need for the workshop and a description of the neriage process.

On September 20, 1997 the three-hour neriage workshop originated from the ICN site at the Scheman Building on the Iowa State campus. Eight high school art instructors participated at three sites–Cherokee, Cedar Rapids, and Mason City. The workshop began with Professor Lilligren discussing some history of the neriage process. She then showed some examples of finished pieces like the one below that were constructed from slabs of neriage clay

Professor Lilligren then went step by step through the construction process, answering questions and addressing problems as they arose. Each of the participants successfully constructed two different patterned blocks of neriage clay that they could take with them to use at a later time.

The following survey questions were sent to the participants after the workshop. Participant answers have been summarized.

1. Before your ICN neriage workshop experience, had you thought that teaching studio art was a possible use for the ICN?

yes=3 no=4

2. Please explain why or why not.

- I thought it was possible because I use the ELMO in the ICN room at our school to show artwork to my classes
- I didn't think it was probable because of the uptight, rigid, clean technology people.
- No, because studio projects are messy
- Yes, with the right subject matter
- Yes, because the ICN provides visual and auditory communication in both directions.
- I wasn't sure you would be able to understand the technique from only viewing and not having the instructor actually there?

3. Did you anticipate any shortcomings of studio art instruction over the ICN? If so, please explain.

- Did not anticipate any.
- I thought it would be ungratifying to sit in a room isolated from your teacher. I like to be shown rather than told.
- Space and availability of equipment
- Potential damage to the ICN equipment from the mess
- I questioned whether or not the teacher would be able to adequately help us with problems in the making process.

4. Did you experience any shortcomings? If so, please explain.

- It was cumbersome to use the mikes when my hands were dirty.
- I felt that people felt reluctant to talk and ask questions.
- It worked well to have plastic to cover the table, but the clay slid when you tried to wedge or slice it.
- It was difficult working with clay without the conveniences of water, sponges, etc. that would be readily accessible in an art room
- No, my neriage clay was assembled successfully. I got a perfect checkerboard/ herringbone design

5. What did you believe would be the greatest benefits of studio art instruction over the ICN?

- The ability to reach distant parts of the state with information and techniques.
- Before the session the only real benefit I saw was that I was going to be able to learn something that otherwise would have been unavailable to me. But what I also found was that I made other contacts with people in my area and picked up some resources.
- Ability to view a small area up close without needing to crowd around.
- Exposure to expert techniques.
- Convenience of learning and ability to network with others who were a great distance from my town.
- Opportunity to learn something new

6. What did you find to be the greatest benefits of the workshop experience?

- Good information and experience in this process.
- The group of students became a community more so than when the "leader" is present. We helped one another and became involved with each other more than people usually do when a teacher is present in the class.
- People all over the state could take the class without having to drive too far.
- Equal learning opportunity. In northwest Iowa there isn't a lot of opportunity for art workshops.

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- It was a great interchange of information with the convenience of saving time and money.
- Contact with a professor and new information that could immediately be put into practice.
- Time to work with the clay after being shown the steps.

7. What suggestions do you have for improvement?
- All labs should have cameras that can pan and zoom on specific areas (projects etc.) Cedar Rapids 3 cameras were fixed and could only zoom in and out. A different mike would have been better.
- The equipment in an ICN room is set up for cleanliness–pen, pencil, book, paper learning. Make the ICN room less "office like" and more flexible designed for the type of activity that might occur in the rooms.
- It would be nice if the camera that shows the teacher was more mobile and could be moved higher or lower by pressing a button.
- I was disappointed that more teachers didn't participate.
- I would have liked the site to be closer to my town.
- Would have liked more participants and a closer location.

8. Will you integrate what you learned in the ICN workshop into your classroom activities? If so, how?
- I already have used what I learned with two high school classes. They have done some projects using the techniques presented.
- I am not sure how I will integrate what I learned in the ICN workshop into my classroom activities. Although it is interesting to know that sometimes when I am busy helping one person this is perhaps good for the other students as they must rely on each other for help. I found that this did a lot of community building in our workshop.
- Yes, I am planning to teach the neriage checkerboard design to the 5th graders. Also, I plan to use the idea of standing in the audience for a normal view by the camera when I take my class to the ICN room
- We will be using it in our clay unit next quarter.
- Yes, students will create the clay during the first week of their semester of class of ceramics. By the end of the first quarter they can slump mold some pieces.
- I have already had my advanced ceramics class make neriage bowls that have come out beautifully.
- I was wanting to share my enthusiasm but didn't know how with my curriculum. I have a new planned curriculum of art history with my upper level students. In my reading with the study of Greece, I learned about the culture of the Cyclades, between the Greek mainland and Asia Minor. They were the first to use the herringbone design. How perfect for us to make neriage in the herringbone pattern.

9. How likely would you be to participate in future ceramic ICN workshops? Please explain.
- Very likely. I would travel one hour each way to a workshop like this sooner than the 2 1/2 hours. the trip to Ames would take.
- I would likely participate in future ceramic ICN workshops if the type of subject offered was of interest to me. The fact that it is over the ICN would not make me more or less apt to take a course offered in my area.
- It would depend on how far I had to drive and what technique was being taught. The neriage was worth a 60 mile drive.
- I think it was great–if the date and weather worked out–count me in.
- Very much! I am a 100 miles distance from any university. I like to contact with that level and variety of knowledge and instruction.

- I would love to be involved in other workshops.
- Very possibly. I would consider if it were new information, hands-on, and of value to my students.

10. What other distance education experiences would you suggest for teachers?
- Any sort of specialized workshop that would require an expert instructor.
- Art appreciation.
- Painting demonstrations, art critiques, art history/artifact discussions
- I have had professional artists meet with students over the ICN show they're work, explain the process and their background, etc.
- Instruction in anything hands on in the upper level visual arts.

11. What other distance education experiences would you suggest for students?
- It would be good for students to see others at their same level and to compare art experiences and art work.
- Painting techniques - because of the ability to zoom in on a flat work surface
- My students enjoyed the Jocelyn experience last year and since we were told we could have 1 field trip every 4 years. Maybe this is how we could expose them to more art. Could they ever meet an artist on the ICN?
- Accomplished artists demonstration and discussing their own works
- I think discussing the art program at the state universities with the faculty would be good. Or an art history professor could give a presentation to high students.
- Tours of art gallery shows, studio artists at work, artists in the school via ICN.

12. Please make any further comments.
- The general makeup of the lab was not well suited for a ceramics project. Dust, fingerprints, etc. Those of us at Cedar Rapids Prairie had a great time and would do it again! Everyone involved was very helpful, thank you.
- Thank you again for this opportunity and for your efforts.
- Teachers need a format for discovering techniques they could share, and lining it up with their schedules, so two art teachers could exchange their strength areas with each other's classes.
- More-more-more
- Thanks for the opportunity!
- This was a new experience–I was excited about this particular subject and the stark results of neriage clay

Several participants have been selected to be interviewed about their impressions of the event. Interviews will also be conducted with the workshop instructor and an outside observer. Participant comments and enthusiasm seem to indicate a willingness to participate in further workshops. One important measure of success resides in the fact that all of the teachers have made plans to incorporate what they learned in the workshop into their classroom activities.

Closing Comments

Shortcomings and suggestions for improvement seemed to focus on the design and setup of the ICN rooms themselves. The layout of the typical ICN room accommodates clean, teacher-centered learning very well. In the case of this workshop, the instructor found that positioning herself in the audience allowed her to use the zoom capabilities of the cameras that were not available if she worked in the instructor area at the front. The participants adapted to the layout of the room, and the immediate unavailability of running water.

They were also very conscientious about cleanliness and care of equipment, but perhaps some consideration might be given to alternative room layouts and equipment choices that help facilitate learning that is more hands-on and group focused. One participant summed the concerns up very nicely.

> The equipment in an ICN room is set up for cleanliness–pen, pencil, book, paper learning. It is not set up for hands on, messy activities, and the people that 'control' such rooms usually do not look leniently upon such situations. In addition to having to control materials to a high degree, the equipment isn't set up for the physicalness of our tasks–no sink, tables too high, tables with wheels that roll when you try to knead. These things can be overcome and were not a huge problem for the one day we did it. But on a regular basis these things would become tiresome. So, maybe making ICN room less "office like" and more flexible designed for the type of activity that might occur in the rooms. Why does it have to be like a temple?

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